

THE AUTOMOBILE

American Dealers' Greatest Show



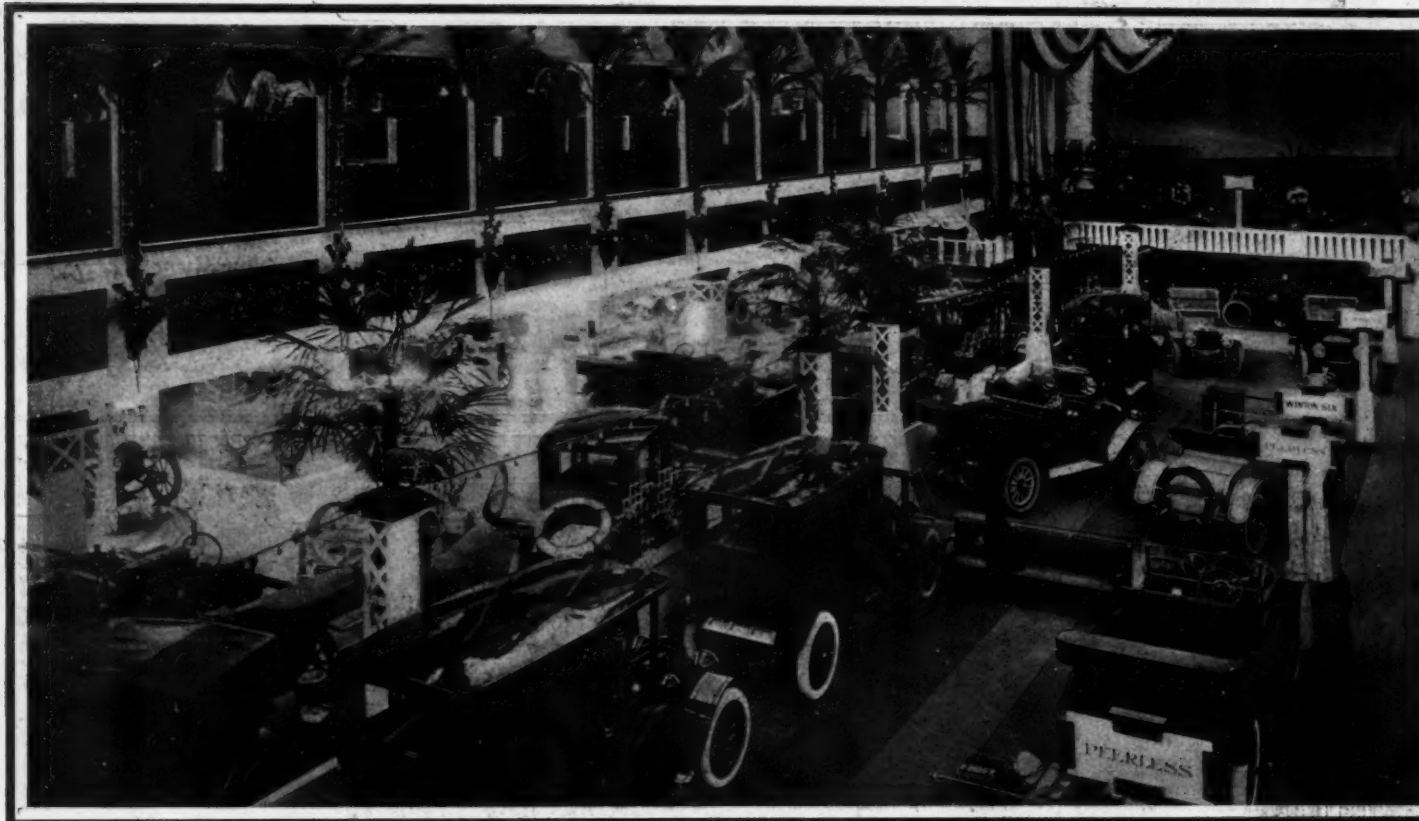
Main aisle of Exhibition Hall, looking west

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OSTON, March 5—New England, made up of the six states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island, has 80,000 automobiles at present, exclusive of commercial vehicles. Each of the hundred car dealers exhibiting at the tenth annual show, which opened here Saturday night, is of the opinion that the territory can afford to buy at least ten cars for every one owned today.

From this it would seem that every dealer will have easy selling for many years to come. If the average life of a car is ten years, merely keeping the present owners supplied would mean the sale of 8,000 cars each year. Taking the dealers' estimates of future possibility of ten cars for each one owned today, there is a market for 800,000 cars in these six states. And this does not allow for future growth in population.

There were 15,821 pleasure cars sold in these six states for 1911, representing an increase in total registration over the preceding year of 26 per cent. A proportionate increase, at least, should be expected for this year, and, figured on this basis, there should be approximately 100,000 machines in the New England states at the close of 1912.



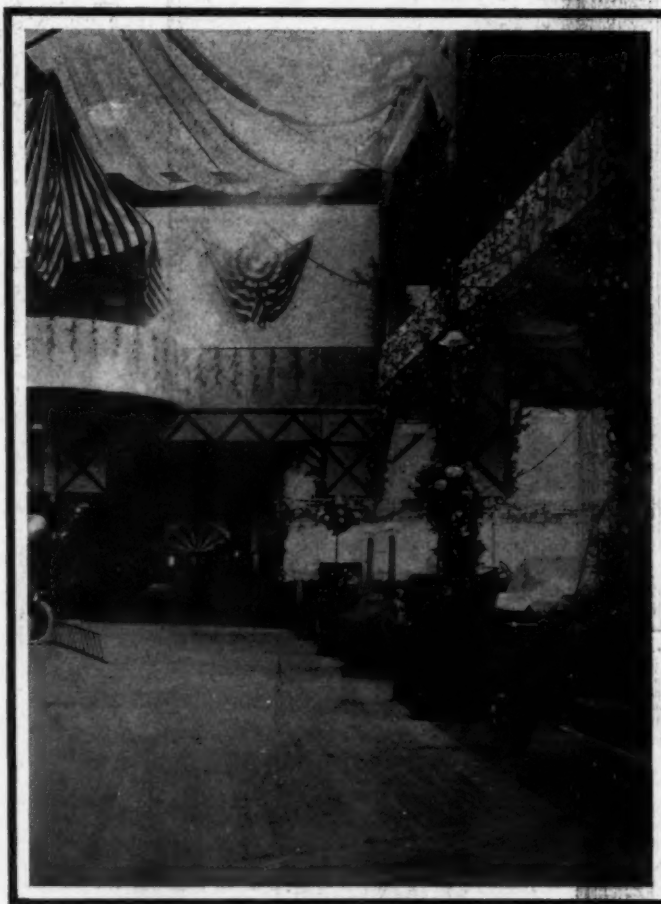
Left side of Grand Hall, looking north. Here a number of the older makes of cars held forth

The dealers almost without exception have made preparations to meet a large number of prospects from all parts of the territory. The Thomas company, for instance, has sent out invitations and admission tickets to 1,000 New Englanders who, they think, are interested in the Thomas car; the Stoddard-Dayton agents have all come in from their territories, and each will meet forty or more prospects during the week; Chalmers expects several hundred interested people; Cadillac has 500 or more prospects, all of whom are expected to visit the exhibit before its close; Knox, while it has no sub-agencies in New England since the factory is centrally located at Springfield, expects over 100 people with whom it has been in touch to come to its booth; Locomobile has made similar provisions to meet its prospects; Rambler, ever the busybody at any show, has sent out a very large number of tickets and invitations to persons who are in the market for cars; and so on all down the line.

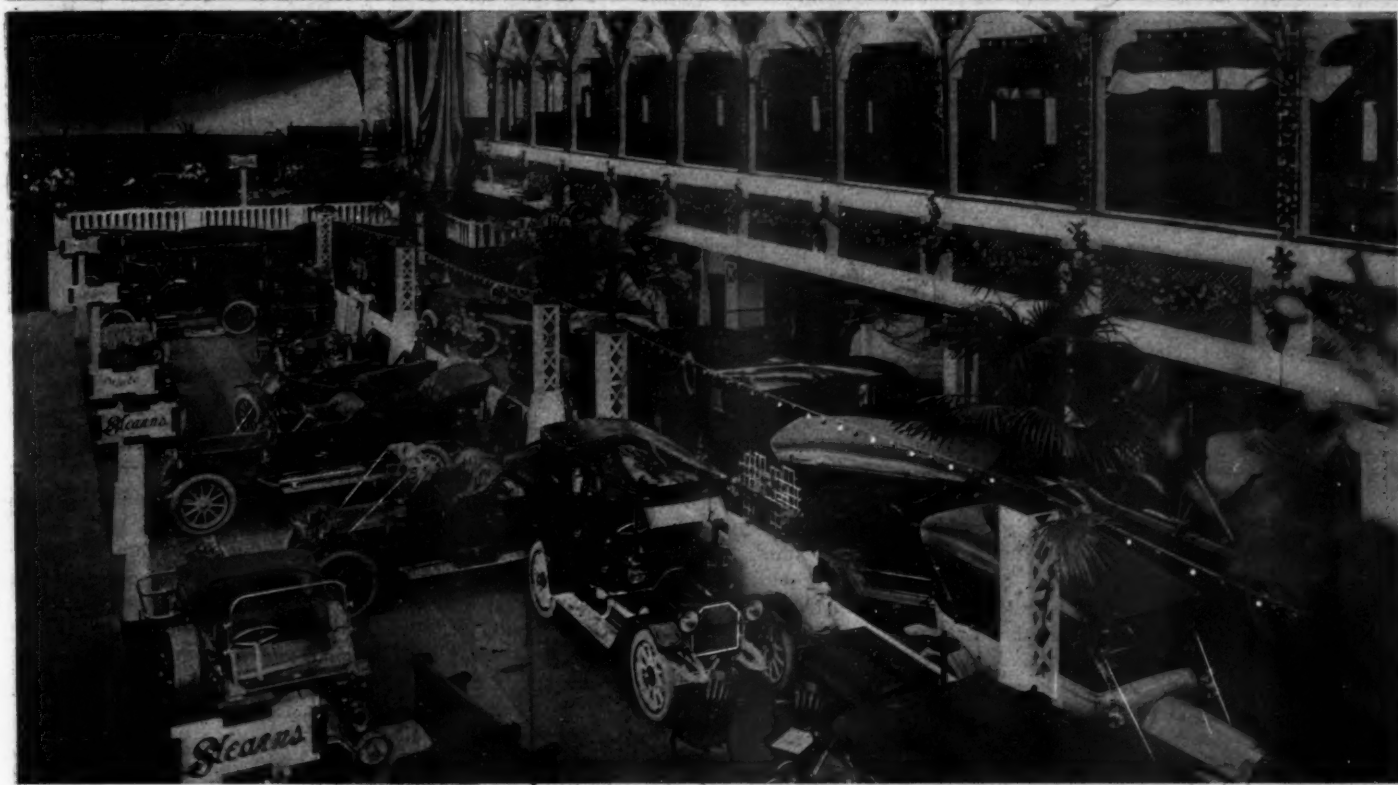
Manager Campbell has sent out 3,000 invitations to dealers and garage men throughout the entire New England region to attend the exhibition. Any man in this category who has been left out, may obtain a pass for the week by simply applying at the office and producing satisfactory credentials to show that he is entitled to as much consideration as he who received an admission privilege beforehand. Last year there were 2,100 of these automobile men who availed themselves of the opportunity to thus inspect the show and to meet prospects from their own territories. It is expected that the number of dealers who will register in this way will this year show an increase of from 30 to 50 per cent.

These men all bring prospects with them, and conservatively figuring that each has two in tow, there will be nearly 10,000 intending buyers on hand from this one source alone.

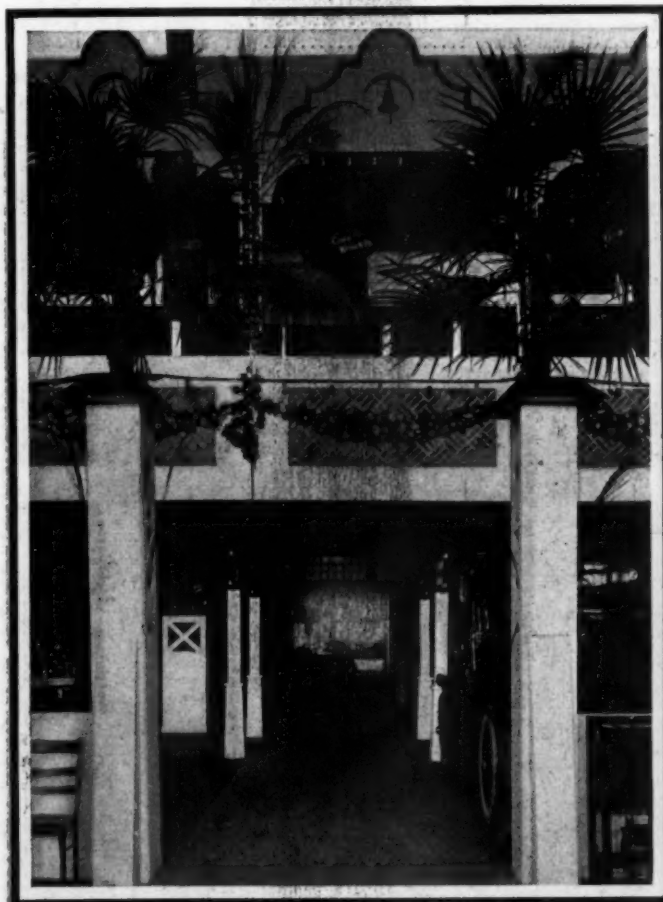
Therefore, for these reasons the present Boston exhibition has every indication of being the greatest medium of the year for retail sales. Last year it is estimated that there were about 4,000 machines the sale of which could be directly or indirectly attributed to the influence of the affair, and while it is



Spanish garden decorative effect in Grand Hall. Here unique mile-posts give the names of the cars at each booth



The other side of the hall. The stage is seen in the background. Accessories were arranged around the balcony



Elaborate floral decorations in Exhibition Hall, which is the first of the show spaces to be reached after entering

yet too early in the week to make any definite statements as to the present exhibition's worth, it may be safely said that this year there will be nearly half again as many orders for which the show is responsible in one way or another. This would mean somewhere in the neighborhood of 6,000 machines to the credit of the enterprise.

Yet with all this growth and activity the industry is not where it should be in New England. With its wealth, good roads and population this six-state combination should be the equal if not the superior of any other community so far as pleasure vehicles are concerned. It is the characteristic New England spirit to be conservative, and this, while commendable, does not make for leadership in a new industry. In the state of New York alone there were 22,334 new registrations of motor vehicles for 1911. Assuming that 10 per cent. of these are commercial machines, the new pleasure cars for the year numbered about 20,000. This is a number greater by 5,000 than the whole of the New England community of six states can boast for the same period. The population of New York is, of course, greater than all of this territory combined, but it must be remembered that New York City is largely responsible for this with its four millions, and that a large part of its population is foreign and of a class not able to purchase machines. Taken on a basis of wealth per capita, New England greatly surpasses the Empire State. In the state of New Jersey there are 48,266 registrations, and at least 40,000 of these are of the pleasure class. Massachusetts has a registration of 38,696, despite the fact that its population is over a million greater than that of New Jersey.

The lack of "push" and the easy-going spirit of the New Englander is demonstrated by the car manufacturers themselves. There are twenty-eight makers of automobiles of one class or another in this section, yet the sales of New England made cars to New England people are outnumbered ten to one by the sales of products to them by manufacturers from other localities. The New England products are in no way inferior to those manufactured elsewhere. Your down-East car manufacturer



View of the Packard and Cadillac booths, which were literally staged on the elevated platform

is an honest builder, but he lacks the hustle and progressiveness of his Western contemporary when it comes to the selling end of the game. There is no reason why the New England manufacturer should not get the bulk of the car business from his own locality, but the fact remains that he does not.

Advertising and great publicity have characterized some of the brilliant successes in the American motor car field, and the New England manufacturer would do well to absorb some of the enthusiasm and hustle of the middle Westerner if he would reap his share of the business which is bound to be done in the splendid territory of which he is a part.

Unlike the New York and Chicago exhibitions, which were national affairs, the cars which are to be seen at the Boston gathering are exhibited by the dealers, rather than the manufacturers. The distinction of having the largest show of the year in the point of number of different makes of cars on exhibition goes to Boston. There are in all 104 makes, which include several foreign gasoline machines in addition to the American types. Ten electrics and one steam car are also in the list.

A new feature this year is the splitting up of the pleasure car and commercial vehicle exhibits into two separate and distinct sections. The commercial show will be opened March 13 and will last until the 20th. This is but another indication of the rapid strides which this annual New England affair has made. While the available space was found to be ample for the amalgamation of both classes of vehicles heretofore, it would have been impossible to have included both in this year's show.

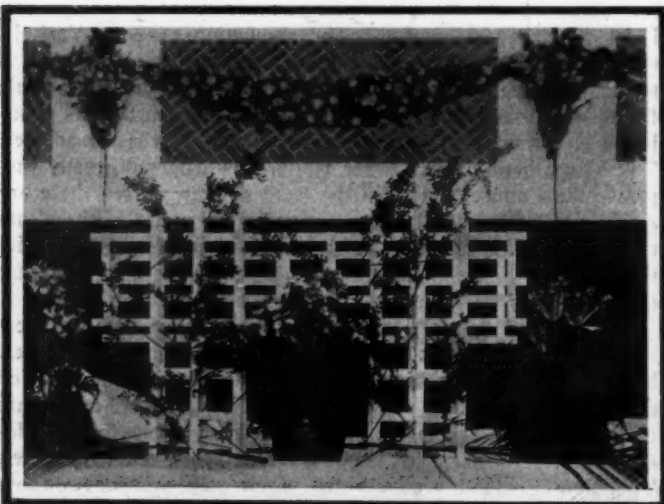
At the present Boston show the large number of models exhibited by certain of the dealers is noticeable. The Chalmers

agent has nine models for the inspection of the public, in addition to which there is a chassis in the space. The largest assembly of Packard machines at any of the big shows is staged, five models being included. Peerless has the same number.

This tendency to show a large assortment of models perhaps accounts for the fact that there are more separate machines exhibited than at any other show of the year, the total being 363. Chicago was next with 344, the Madison Square Garden had 248 and the Palace 163. Some of the number in the last-named total were trucks.

A comparison of the principal shows in this respect follows:

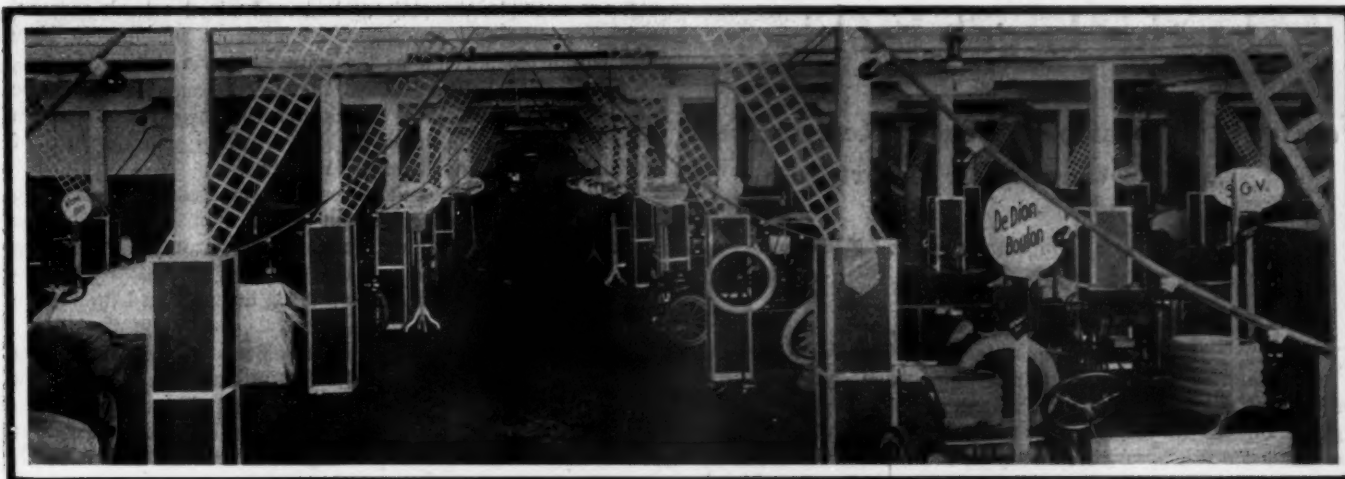
Exhibition	Number of makes shown	Total number of cars
Boston	104	363
Chicago	98	344
Madison Square Garden	60	248
Grand Central Palace	31	163



Trellises and floral decorations in Grand Hall



Stairway leading to the stage at the north end



In the basement under Grand Hall. Here cars and accessories were intermingled

The list of cars which makes these record totals at Boston contains the principal machines manufactured, so that the intending purchaser really has all that he could desire before him. Although Boston has never been a very good market for the electric pleasure type, many of the leaders in this field are present. Several machines which have not appeared in any other show of the year are here. Among these newcomers are the Ford, Apperson, Chadwick, Lenox, Berkshire and Moyer.

The complete list of the cars is given below:

Cars at Boston			
American	Auburn	Babcock El.	Cunningham
Amplex	Alco	Bergdoll	Chalmers
Apperson	Baker El.	Berkshire	Chadwick
Abbott	Bailey El.	Cadillac	Cutting
Atlas	Buick	Case	Cole

Cartcar	Jackson	Mercer	Royal
Columbia	Kissel	Norwalk	Renault
Detroit El.	Knox	National	R-C-H
De Dion	Krit	Nyberg	Stearns
Everitt	King	Oakland	Stevens-Duryea
Elmore	Lozier	Ohio	Stanley
E. M. F.	Locomobile	Oldsmobile	Speedwell
Firestone-Columbus	Lenox	Ohio El.	S-P-A
Fiat	Lexington	Ottomobile	Stoddard
Ford	Lion	Overland	Selden
Flanders El.	Metz	Packard	Staver
Franklin	Matheson	Peerless	S. G. V.
Garford	Metallurgique	Pierce	Stutz
Great Western	Maxwell	Penn	Thomas
Hudson	Moyer	Premier	Velie
Haynes	McFarlan	Pullman	White
Hupmobile	Mitchell	Paige-Det.	Winton
Hupp-Yeats	Moon	Pope-Hartford	Westcott
Havers	Marquette	Rambler	Waverley
Imperial	Marion	Reo	Warren-Detroit
Inter-State	Marmon	R. & L. El.	

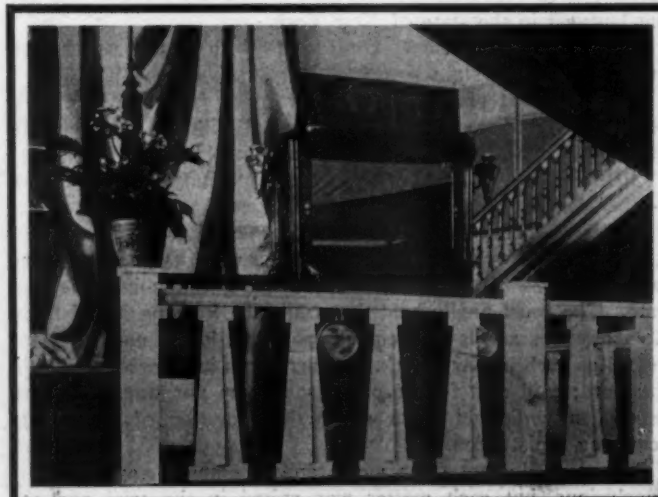


Real evergreen hedges and artificial rose corner pieces

The stage, which is at one end of the Grand Hall, is occupied by the exhibits of Packard and Cadillac cars. On either side of this stage there is another and very much smaller elevated platform on which an electric is placed. White fences surround them, and the arrangement reminds one of a huge theater, the two electrics being the occupants of the boxes.

In the halls and corridors above the Exhibition Hall the majority of the accessory makers have been quartered.

All the tire makers are on hand, but it is noticeable that the majority of the makers of chassis parts, such as frames, steering gears, front and rear axles, and the like, are missing. This is easily explained from the fact that manufacturers of these goods do not wish to appeal to individual buyers, but only to car makers who are present in numbers at the national exhibitions. There are about 200 exhibits of accessories in all.



One of the boxes at the side of the Grand Hall stage

In the Legal Field

Foreign Corporations Must Register to Have Standing in Court

Asked to Have Clark Company Adjudged Bankrupt—
Cases Go Over Until April

FOREIGN corporations doing business in New York have no standing in a state court unless they have complied with the provision of the law which requires the payment of a registration fee to the proper authorities. This ruling, which was handed down by Justice Brady in the New York Supreme Court last week, was made in the suit of the Reading Metal Body Company, of Fleetwood, Pa., a foreign corporation against the Palmer & Singer Manufacturing Company, a New York corporation.

The suit itself was of small importance compared with the question of law it raised. The suit was simply on a disputed account involving payment for a lot of automobile bodies ordered by the Palmer-Singer and manufactured by the Reading concern, and judgment was rendered against defendant for \$8,070.

The interesting feature of the matter is as to the status of foreign corporations in New York. The statute provides that foreign corporations doing business in New York must be registered so that they may come under the jurisdiction of the New York courts without undue expense and delay in case cause for action arises within the state.

This is accomplished by requiring some responsible officer to be named so that in case of suit service can be had upon him without loss of time. The law provides for collecting a certain license fee in case money is invested within the state, but where there is no taxable property or money used by the foreign corporation, the tax amounts to nothing.

The law further states that no foreign corporation can sustain a suit at law against a citizen of New York unless it is registered, providing that the foreign corporation so suing is doing business in New York in contravention of the statute.

In the case in point, Jay N. Emley, attorney for Palmer-Singer, raised the question in his answer to the complaint filed by Roger Lewis on behalf of the Reading company.

Mr. Emley's answer setting up a defense entirely separate and distinct from the original matter in suit was as follows:

"As and for a second separate and distinct defense, defendant alleges upon information and belief that the plaintiff is a foreign stock corporation other than a moneyed corporation, doing business in the state of New York.

"Third—That the alleged contract sued on in this action was made within this state.

"Fourth—That plaintiff has not procured from the Secretary of State a certificate that it has complied with the requirements of the law to authorize it to do business in this state.

"Fifth—That * * * plaintiff has not paid a license fee of 1-8 per centum or any license fee whatever."

On this showing the defendants demanded judgment.

The trial occupied 5 days and was carried to extraordinary length by reason of the injection of this question into the dispute. The court finally held that while the Reading Metal Body Company was and is a foreign corporation, it had no money invested as such in New York. It carried no bank account within the state; paid rent for no office, salesroom nor warehouse and consequently did not come within the provision of the statute requiring registration.

The court did not file a memorandum opinion covering these conclusions, but each matter was raised in the trial and the direction of a judgment bears upon each of them.

If, for example, the plaintiff had maintained a bank account, paid office rent and conducted a continuous business in New York within the purview of the statute but without registration, the court might have sustained the present suit on the simple point of law, because the statute places unregistered foreign corporations doing business in New York beyond the help of remedial law covering commercial claims.

As there are numerous instances of foreign corporations doing business within the state without registration, which might be construed to be within the meaning of the statute, in transacting business with individuals and corporations of New York residence, the defence of Mr. Emley takes on an added interest to the business world.

It was shown in the trial that the officers of the complaining corporation were in the habit of soliciting business in New York either personally or by correspondence and that the orders so secured were filled at the factory. One of these instances was proved as between the Palmer-Singer concern and the plaintiffs.

Many Cases Go Over Till April

Rule day in the United States District Court passed uneventfully. There are numerous cases on the court calendar of vast interest to the automobile industry, but none of the new issues is to be heard in March. The four cases of the Enterprise Automobile Company against Maxwell-Briscoe, Winton, Locomobile and Saurer have gone over until the first Monday in April by stipulation as previously announced.

The broad spark-plug case brought by A. R. Mosler & Company against several manufacturers of spark-plugs alleged to infringe the Canfield patent has gone over to April rule day.

The suit of the Warner Instrument Company against Stewart & Clark may come to a hearing before rule day. The case of Sager against Grossman, involving the Sager bumper patent, is on the calendar, but has twenty-seven cases ahead of it. Unless it is called out of turn it is unlikely that it will be reached within a week.

Want Clark Company Adjudged Bankrupt

SHELBYVILLE, IND., March 2—Some of the creditors of the Clark Motor Car Company have filed a petition in the United States Circuit Court in Indianapolis, asking that the company be adjudged bankrupt. The claims of the creditors joining in the petition amount to less than \$600 and the signers are the Van Camp Hardware & Iron Company, Indianapolis; the B. F. Goodrich Company, Akron, O., and the Ditzler Color Company, Detroit, Mich. The company was located originally at Anderson, but was moved to Shelbyville some months ago, and recently John Clark, designer of the Clark car, withdrew from the concern. Only a few men have been employed recently.

Individual Dyer Licenses Issued

Two more individual Dyer licenses have been granted. The Hon. John J. Brady, of the New York Supreme Court, owner of a Darracq car, applied for a license voluntarily. No suit was filed against him. The other case was that of William Paul, owner of a garage in the Bronx, who has a Sultan.

Mr. Paul engaged in some preliminary litigation before he decided to take out a license and suit was entered against him. Formal orders in the Paul case are now before the Federal Court.

Object to 15 Per Cent. Settlement

Objections were filed in the United States District Court Monday against the acceptance of the creditors of the Züst Motor Company of the composition of 15 per cent. offered by the involved concern. A majority of the creditors have expressed themselves as favoring the composition, but the action

of the objectors had the effect of postponing the discharge of the company until after another session in court.

The case has been put over until Monday, March 18.

Decision That Points the Way

Holding that the railroad rate charged on vehicles in carloads from Elkhart, Ind., to Milwaukee of 23 1-2 cents per 100 pounds is excessive and unjust, the Interstate Commerce Commission has chopped 5 cents from the rate.

The vehicles referred to are not automobiles, which take a much higher classification. Automobile manufacturers who are at present protesting against the high classification charged for shipment over the railroads were much interested in the decision of the commission. They figure that if the rate on vehicles is too high, the rate on automobiles must also be too high.

Valveless Tube Injunction Dismissed

Injunction proceedings brought by the Valveless Inner Tube Company, a subsidiary of the Walpole Rubber Company, of Walpole, Mass., to prevent the Sealomatics Parent Syndicate of England, from disposing of certain secret processes of manufacture, essential in producing the valveless inner tubes have been dismissed following a settlement of the matter out of court.

The Valveless Inner Tube Company purchased rights to manufacture such tubes under patents 949,947 and 959,960, but subsequently it was discovered that without the secret formulae in the possession of the Sealomatics company, the mere patent rights were worthless.

It was feared that the formulae might get into the possession of outside parties and the suit for injunction to prevent the Sealomatics from disposing of such formulae to any other concern besides the Valveless Inner Tube Company was started.

Under the terms of the settlement, the Sealomatics company has turned over to the complainant the formulae in question and the suit has been withdrawn.

Submit Pleading in Lozier Suit

Complying with the rule of the New York Supreme Court requiring a bill of particulars, describing an alleged contract to sell control of the Lozier Motor Car Company and other pertinent matters, attorneys for Williams & Rhinock, plaintiffs in the suits, submitted such a pleading.

Hugh Herndon, attorney for the Lozier company, and Mr. Lozier, moved that the bill of particulars filed be refused by the court on the ground that it contained practically a repetition of the facts alleged in the complaint and did not elucidate the matters desired by the defense. The court granted the plaintiffs time in which to file an amended bill of particulars.

See Light in Cameron Bankruptcy

Considerable progress is being made in the Cameron bankruptcy case. An accountant is now going over the books of the concern at Beverly, Mass., and the officers have been summoned to appear for examination as to the affairs of the company.

The trustee in bankruptcy has obtained permission to finish up a few cars and the proceeds will be credited to the estate.

Another Allen vs. Niagara Suit

Suit has been filed by the Allen Auto Specialty Company, of New York, against the Niagara Auto Cover Company for alleged infringement of another phase of the Nathan patent, number 799,662. Appearance is due the first Monday of April in the United States District Court and answer will probably be filed on May rule day.

In this suit the principle involved is the water-shedding feature covered by the patent. Another suit was filed some time ago involving an entirely different claim of the Nathan plant.

Patent and Trademark

Norma Sues Bretz on Both Points— Allen vs. Niagara

Patent Actions Restricted in Scope—Claims Fraud in Tire Filler Case

ANSWER will be filed on behalf of the J. S. Bretz Company, American representatives of the F. & S. factory, in the suit of the Norma Company of America on the May rule day of the United States District Court. The suit was brought on patents numbered 774,427 and 796,648 and trademark 43,038.

The patents cover a type of magneto bearing, according to William A. Redding, counsel for the defense, and should not be confused with other kinds of bearings not involved in the suit.

Mr. Redding explained that the trademark was brought into the litigation because a few hundred magneto bearings of the type involved in the suit were stamped with the name Norma. Both sides are confident. The Bretz company alleges that the F. & S. basic patents antedate those in suit.

Scope of Patent Actions Restricted

Judge Noyes, in the United States District Court, Southern District of New York, has rendered an opinion defining another phase of patent procedure, holding that an action to enforce the terms of patent may not also include a prayer for relief on the ground of unfair competition.

In the particular case involved the court held that the petition of the Lovell-MacConnell Manufacturing Company against the American Ever-Ready Company in which the basic Klaxon patents were the subject matter should not contain as a joint issue a proceeding to declare unfair competition. The court ruled that such a provision should be eliminated from the petition.

The ruling does not go into the merits of the patent suit, which will be fully tried out in the test case on the main facts.

Fraud Alleged in Tire Filler Case

WASHINGTON, D. C., March 4—Suit for injunction has been filed by John B. Hart, of Clarksburg, W. Va., against R. Ernest Whitney, of New York, and Warren B. Buckley, of this city. He alleges they induced him to invest \$4,000 in cash and give his notes for \$16,000 for two-thirds of the issue of the stock of the Airease Tire Filler Company by alleged misrepresentations. Hart asks that the holders of the notes be enjoined from disposing of them, and that he have judgment for the injury alleged to have been sustained by him. Hart says he was told that Buckley was the sole owner of the formula for making the filler; that the rights for the District of Columbia had been sold to Harry Wardman, a wealthy real estate operator, for \$10,000, and that George Westinghouse had paid \$125,000 for the right to use the product in New York state, and that a contract had been closed for the Illinois territory at \$125,000. He asserts that these alleged claims are untrue. The court has issued a rule on the defendants to show cause why the negotiation of the notes should not be stopped.

Bought Stock and Is Now Sorry

DETROIT, MICH., March 4—Peter S. Fleming has brought suit by capias against Warren D. Clizbe and James C. Brown for \$5,000 damages. Plaintiff purchased stock in the Michigan Motor Truck Company and he alleges that the business was not as profitable as it was represented. The defendants were taken into custody on the capias but were immediately released on bail.

Will Continue to Make Cars

American Automobile Mfg. Company Re-organized—Company Formerly Built Jonz Car

Hupp Moving Into New Factory—Will Make Washington Commercial Cars

NEW ALBANY, IND., March 2—Steps have been taken to reorganize the American Automobile Manufacturing Company, at the termination of the receivership. This was done at a meeting held at the plant this week when two-thirds of the stock was represented. An organization committee was appointed and authorized to proceed with the reorganization. The members of the committee are: L. A. Boli, Jr., of New Albany, chairman; John Seeger, Charles Hayden, E. L. Boli and Thomas McCullough, of Louisville; Louis Bauer, of St. Matthews, and M. E. Jones, C. Charles Jones, Dr. J. W. Baxter and G. N. Little, of New Albany.

Following the meeting it was announced that the automobile plant, which was equipped to manufacture the Jonz car, will be continued on a larger scale than before. L. A. Boli, vice-president and general manager of the old concern, says that the name of the new company will be the American Automobile Corporation and the capital stock will be \$250,000. The new company will take over the stock of the old concern and the old stockholders, who have filed claims against the company to the amount of \$30,000, will be paid 40 per cent. of their claims in stock in the new company. Outside creditors, Mr. Boli said, would be paid in full by the new company.

Mr. Boli said he believes about 60 days will be required to complete the organization and lift the receivership. He also announced that in the meantime the New Albany Trust Company, the receiver, will apply to the court for permission to complete the manufacture of unfinished automobiles which the old company had in stock.

To Make Washington Commercial Also

HYATTSVILLE, MD., March 2—The Washington Motor Car Corporation with a capitalization of \$600,000, was organized by the officials of the Carter Motor Car Corporation to manufacture a complete line of four- and six-cylinder cars of both pleasure and commercial types. The old stockholders are to receive an equivalent number of shares of the new company in exchange for their respective holdings in the old corporation.

Twenty-nine business men of Washington, Hyattsville and Bladensburg, Md., will compose its directors. Among those who will shape its affairs and compose its directorate are: W. D. Barry, Louis S. Kann, W. L. Bowles, John R. Sharp, M. D.; H. M. Dixon, M. D.; Hugh F. Harvey, J. D. Darnall, Thomas E. Latimer, M. D., Hyattsville, Md.; Guy Latimer, M. D., Hyattsville, Md.; W. P. Magruder, Hyattsville, Md.; J. F. Lillard, Hyattsville, Md.; Thomas F. Murray, P. M. Galvin, M. H. Herriman, W. K. Hill, Samuel Gassenheimer and C. C. Geve.

In the motor delivery class a specialty will be made of a new designed car that permits of exceedingly low cost of production.

Hupp Moving Into New Factory

DETROIT, MICH., March 4—The Hupp Motor Car Company began Saturday to move to its new plant at Mt. Elliott and Milwaukee avenues and the men who quit work in the old plant on Jefferson avenue, Saturday noon, reported for duty at the new one this morning. Factory Superintendent Clarence A. Hillis superintended the transfer, which was accomplished with the aid of twelve 3-ton motor trucks and a force of 100 men,

working in day and night shifts. The company's new executive offices are not yet ready for occupancy and probably will not be until April 1. In the meantime the business of the company will be directed from the old quarters on Jefferson avenue. The new plant just about triples the company's capacity, and there is ample ground room for additional buildings as they are needed.

Bailey in Abbott Motor Company

DETROIT, MICH., March 1—At a recent meeting of the directors of the Abbott Motor Company Clayton E. Bailey, of Jamestown, N. Y., was elected first vice-president and chairman of the board of directors. For several months past C. W. Jamieson, of Warren, Pa., president of the company, has been seriously ill and his health is in such condition that he will be unable upon recovery from his present illness to assume active duties as head of the company.

At the suggestion of Mr. Bailey the board of directors passed a resolution to the effect that the policies and all matters pertaining to the management of the company are to be handled by an executive committee, consisting of W. T. Bush, sales manager; B. C. Spitzley, assistant general manager, and M. J. Hammers, general manager, the general manager to be chairman of the committee, and the chairman of the board of directors to be a member *ex-officio*.

Poole Hubmobile Export Manager

DETROIT, MICH., March 2—The increasing demand for Hupmobiles throughout continental Europe has necessitated the establishment of permanent export headquarters in Paris and the appointment of the pioneer export promoter of American automobiles, John L. Poole, as European export manager.

Mr. Poole will start early in April for Paris, where he will make his permanent headquarters at 11 Rue Scribe. The Hupp motor car has already another resident representative in Australasia, E. G. Eager, who makes his headquarters at Auckland, New Zealand.

Overland Company Increases Force

TOLEDO, O., March 2—The Willys-Overland Company has increased its working force several hundred in the past few weeks. A large amount of new automatic machinery is also being installed and numerous other improvements made which will result in larger production. All departments engaged in the making of automobile bodies have been removed into the new five-story concrete addition which has just been completed. New machinery will be installed in the original plant where vacant space was occasioned by the removal. The concern now has an output of about 100 cars a day.

Russell Offering Proves Popular

TORONTO, CAN., March 2—The offer recently made by the Russell Motor Car Company, to its shareholders of \$400,000 of new preference convertible stock seems to have been popular. The shares have all been taken and although the total amount required on allotment was \$80,000 the company has already received \$285,000 in cash, a large proportion of the shareholders having taken advantage of their privilege to pay in full.

To Make Combination Electric Devices

INDIANAPOLIS, IND., March 2—The Electric Lighter and Starter Company has been organized in Indianapolis to manufacture a lighter, igniter and starter invented by James K. Delano, Jr., and the rights to manufacture which were until recently held by the Electro Lighting Company. The new company has been incorporated with an authorized capitalization of \$500,000 with Frank Wheeler, of Wheeler & Schebler; Joseph E. Bell, Charles C. Wedding, Samuel C. Renick and Harry J. Spann as the in-

corporators. The company will manufacture electric devices for motor car lighting, for lighting and ignition, for lighting, ignition and starting of the engine and for lighting and starting. Manufacturing operations by the Electro Lighting Company have been conducted in the Industrial Building, but the new company will seek larger manufacturing facilities.

Packard Declares Regular Dividend

DETROIT, MICH., March 4—Directors of the Packard Motor Car Company have declared the regular quarterly dividend of 1 3/4 per cent. on the preferred stock, payable March 15 to stockholders of record March 5. The transfer books will be closed March 6 to 15, inclusive.

There has been some demand for Lozier Motor Company stock on the Detroit stock exchange. A bid on 50 shares was invited last week, the quotations standing at 70 bid and 73 asked.

Rubber and Spot Cotton Lower

Following the London rubber auction last week, when 850 tons of crude rubber, mostly plantation stock, was sold under the hammer at steady prices, the market has reacted slightly and stands about 1-2 penny lower on the basis of up-river Para.

Short selling in the market, along the same general lines noted previously, has been quite apparent. There is no London auction scheduled for this week, and barring the manipulation the news affecting the market is moderately bullish aside from the selling operations.

Spot cotton is 5 points lower on the general average in the New York market and trade is dull. Heavy purchases by manufacturers who make fabric for automobile tires were made last month and for the moment these elements are absent from the market.

Successful Test of Knight Engine

WINNIPEG, MAN., March 2—To have run for 15 consecutive days, or 360 hours, without a stop and to have also run that time without the aid of additional water establishes two world's records for the Knight engine used in the Russell car. The engine, which already had a record of 21,683 miles, was started at 11 o'clock on February 12 in the showrooms of the Russell Motor Car Company, on Donald street, by Mayor Waugh. On the morning of February 27 at 11 o'clock the Mayor stopped the engine after its lengthy run.

Tests made just before the stop showed it was running a little faster than when started, 680 revolutions per minute being indicated. At the start the number of revolutions was 580.

Board of Trade 1912 Annual Out

Containing 207 pages describing in tabular and pictorial form the various models made by members of the Automobile Board of Trade, the annual hand book of that organization has been issued. This year the book covers 165 models of pleasure cars and twenty-eight commercial cars of various types. The Board of Trade consists of sixty-two manufacturing companies.

Besides the car descriptions the book contains the roster of the organization, committees and catalogue request blanks.

Vacuum Company Increases Capital

ROCHESTER, N. Y., March 1—The Vacuum Oil Company at its annual meeting here decided to increase its capitalization to \$15,000,000. The following directors were re-elected: Charles M. Everest, Edwin Prizer, George C. Whaley, Charles C. Bedford and Charles C. Campbell. The board will meet in New York City, March 7, for reorganization. It has been practically decided to increase the board to eight members.

International Absorbs Hewitt

Combination Prepared to Build Vehicles of Capacities Ranging from 1500 Pounds to 10 Tons

Indiana Branch of S. A. E. Formed—Packard Company Declares Quarterly Dividend

ABSORPTION of the Hewitt Motor Truck Company by the International Motor Company was consummated March 1. The sales and executive departments were amalgamated with the International on that date. The company will continue to operate the Mack plant at Allentown, Pa.; the Saurer factory at Plainfield, N. J., as well as the New York factory of the Hewitt concern. The line of trucks thus provided extends from wagons of 1,500 pounds capacity to 10 tons. The acquisition of the Hewitt completes the line of heavy-duty trucks produced by this company.

Rumors of a merger of the Lansden factory with the International Motor Company have been quiet since the Hewitt announcement and no confirmation of them could be secured.

Hoosiers Form S. A. E. Branch

INDIANAPOLIS, IND., March 2—A permanent organization of the Indiana branch of the Society of Automobile Engineers was completed at a meeting held in the rooms of the Hoosier Motor Club in the Claypool Hotel on Thursday evening. Permanent officers were elected as follows: Chairman, W. G. Wall, of the National Motor Vehicle Company; vice-chairman, C. S. Ricker; secretary, Charles S. Crawford, of the Cole Motor Car Company, and treasurer, George A. Weidley, of the Premier Motor Manufacturing Company; Howard Marmon, of the Nordyke & Marmon Company, was made chairman of the membership committee and F. E. Moscovics, of the American Motors Company, chairman of the committee on papers. C. S. Ricker was made chairman of the publicity and advertising committee.

Dealers in Three Cities Organize

DAVENPORT, IA., March 4—The Tri-City Automobile Dealers' Association has been organized for the purpose of bringing the dealers of the three cities closer together and prevent price cutting. The new association will manage the annual show in the future instead of the Davenport Automobile Club. The following are the officers: President, G. E. Burmeister, Davenport; vice-president, H. H. Derrough, Davenport; secretary-treasurer, W. L. Mason, Davenport; directors: G. F. Burmeister, H. H. Derrough, W. L. Mason, Davenport; W. C. Totten, Rock Island; Fred R. Young, Moline.

St. Louis Attacks the Noise Evil

ST. LOUIS, MO., March 4—The Fletcher ordinance, which recently passed the city council and was signed by the mayor, is intended to check the abuse of the muffler cut-out and warning signals by automobilists in the city. The ordinance provides as follows:

Section 25.—A. No person or company owning or in charge of any motor vehicle shall cause, suffer or allow smoke, steam or vapor to escape therefrom in quantities in excess of the amount not preventable by the use of all appliances and apparatus, condensers and other improvements to prevent all necessary escape of smoke, steam or vapor. Every motor vehicle or motorcycle while being used upon the streets, alleys and public places of this city shall be provided with a suitable bell, horn or other signal device, and it shall be unlawful for a person to use any device which will not produce an abrupt sound sufficiently loud to serve as an adequate warning of danger, and it shall be unlawful for any person operating any motor vehicle or motorcycle to make or cause to be made any unnecessary noise with any such bell, horn or other signal device, or to use the same except as a warning of danger, nor permit said motor vehicle to make any unnecessary noise by cutting out the muffler or in any other manner.

Truck Makers Discuss Many Vital Problems

Forty-two Heads of the Industry Make Recommendations on Speed, Over- load, Weight and Guarantees

Interesting Papers on Effects of Speed on Tire Wear and Other Timely Subjects

FORTY-TWO leading representatives of the motor truck industry in America met in the headquarters of the National Association of Automobile Manufacturers in this city on Monday and Tuesday of this week and discussed many problems of vital interest to the truck industry. Among the leading topics discussed and on which recommendations were made to the N. A. A. M. were speed of trucks and delivery vehicles, permissible overload, limit of body weights in proportion to load capacity, form of manufacturer's guaranty and maintenance guaranty. In addition to the discussion and passing of resolutions on these subjects three addresses were given on subjects of interest. S. V. Norton, of the Goodrich Rubber Company, spoke on "Detrimental Effects of Overloading and Overspeeding on Solid Rubber Tires"; W. P. Kennedy, of the American Locomotive Company, talked on "Maintenance Guarantees" and David Beecroft took as his subject "Impediments to the Introduction of Commercial Vehicles in Chicago." Spirited discussions followed the reading of all the papers.

The two-day session was arranged for and looked after by a special committee appointed by the N. A. A. M. and consisting of S. D. Waldon, Packard company, chairman, and assisted by Walter White, of the White company, and B. F. Gramm, of the Gramm company.

The major accomplishment of the Monday session was the recommendation to the N. A. A. M. of the adoption of the pleasure car form of manufacturer's guaranty for commercial vehicles, with the addition of clauses thereto covering the permissible vehicle load and also speed. The form of guaranty recommended is as follows:

We warrant the new motor trucks manufactured by us for 90 days after date of delivery to purchaser, this warranty being limited to the furnishing, at our factory, of such part or parts of the motor truck as shall, under normal use and service, appear to us to be defective in material or workmanship.

This warranty is limited to the shipment to the purchaser, without charge, except the transportation, of the part or parts intended to replace the part or parts which, upon their return to us, at our factory, for inspection, we shall have determined were defective, and provided the transportation charges for the part or parts so returned have been prepaid, and provided further that the said failure of the said part or parts is shown not to be due to abnormal use, misuse, neglect or accident, occurring after such motor truck shall have been shipped to the purchaser.

We make no warranty whatever in respect to tires, rims, ignition apparatus, lamps, gas tanks, signaling devices, generators, or other trade accessories, inasmuch as the same are usually warranted separately by their respective manufacturers.

The condition of this warranty is such, that, if the motor truck to which it applies, is altered or repaired outside of our factory, or if it is operated at a speed in excess of its factory rated speed, or if it is loaded beyond its factory rated load capacity, then this warranty shall become null and void and our liability under it shall cease.

Second in importance to the matter of manufacturer's guaranty was that of truck speeds, loads and overloads as well as body weights. In the accompanying tabulation the field of truck capacity from 500 pounds to 10 tons is covered. The miles per hour of each vehicle is given, which ranges from 16 miles per hour for the 1,000-pound vehicle to 5 miles per hour for the 5-ton truck. In each type of vehicle the permissible overload is placed at 20 per cent. This knowledge is most valuable and will do much to correct a deplorable abuse that exists at present, namely, that of salesmen and some manufacturers who talk as high as 50 and 100 per cent. overload. Much abuse has crept into the industry on the matter of heavy bodies and the tabula-

tion shows the permissible body weight for each type of vehicle. In the 1,000-pound vehicle the body weight is 50 per cent. of the load capacity, but in the 10-ton truck it is but 12 per cent. of the load. Much trouble has resulted up to this time in too heavy bodies. Some bodies have been so absurdly heavy as to hamper the legitimate performance of the truck and to place a destructive overload on the tires. The tabulation follows:

Tons	Pounds	Rating		Miles		Weights	
		20% Overload (pounds)		Per Hour		Weight Std. Body (pounds)	Weight Ld. & Ld. Body- Overload (pounds)
1/2	1,000	200		16		500	1,500
1	2,000	400		15		600	2,600
1 1/2	3,000	600		14		700	3,700
2	4,000	800		13		800	4,800
2 1/2	5,000	1,000		12		900	5,900
3	6,000	1,200		11		1,000	7,000
3 1/2	7,000	1,400		10 1/2		1,100	8,100
4	8,000	1,600		10		1,200	9,200
4 1/2	9,000	1,800		9 1/2		1,300	10,300
5	10,000	2,000		9		1,400	11,400
5 1/2	11,000	2,200		8 1/2		1,500	12,500
6	12,000	2,400		8		1,600	13,600
7	14,000	2,800		7		1,800	15,800
8	16,000	3,200		6		2,000	18,000
9	18,000	3,600		5 1/2		2,200	20,200
10	20,000	4,000		5		2,400	22,400

S. V. Norton in speaking on the "Detrimental Effects of Overloading and Overspeeding on Solid Rubbers" explained overloading, its bad effects and possible cures as follows:

What is meant by the overloading of rubber tires? In the process of manufacture crude gum is mixed with pigments and the whole mass is kneaded together until the compound becomes homogeneous. After various intermediate steps, the rubber is placed in a mold and vulcanized. During vulcanization the tire assumes a more or less permanent form, to which it will normally return if it is not stretched or compressed beyond certain definite limits. If the stretching or compression exceeds these limits, however, the strain will invariably cause a rupture or disintegration of the rubber.

To illustrate: Take a strong, properly vulcanized rubber band. Stretch it moderately, release it, and it will return to its normal shape. The process may be repeated indefinitely, and the band will resume its shape. Stretch it beyond its limit of elongation, however, and the rubber breaks, and you can't restore it to its previous condition. The damage has been done, the rupture is permanent. Similarly, a piece of rubber properly vulcanized may be compressed within certain limits; released, and it will resume its normal shape. The compression may be repeated an indefinite number of times, depending upon the quality of the compound. So long as its limit of compression has not been reached, the rubber will continue to spring back into shape and nothing but abrasion or some other physical or chemical action will destroy its elasticity. Compress it beyond its limit of cohesion, however, or, in other words, beyond its power of resistance, and the rubber breaks down or ruptures just as inevitably as in the case of stretching beyond its limit of elongation. The rupture is absolute and permanent. No method yet devised will restore to the unit its former elastic qualities. The damage is done, and disintegration has commenced—not because the average load exceeded the limit of resistance, but because some one load exceeded it, and started the rupture. If I can impress upon you the great danger of ruining solid tires from once overloading them I shall feel gratified.

Tire manufacturers have adopted a schedule of carrying capacities which, with but slight variations, is now considered standard. The factor of safety in the schedule is nil. So many other factors enter into the matter, such as excessive strains due to bumps, depressions in the roadway, negotiating grades, overspeeding, and the severe use of brakes, that no provision has been made for overload.

Three Kinds of Overloading

There are three kinds of overloading. The first is due to undersized original tires. I fully realize that the competition in your business makes it necessary for you to economize wherever possible in the equipment of your trucks. You build the best machines that money and skill can devise, and you offer them for sale fully guaranteed—except for tires. Without knowing the danger you are running you may perhaps equip them with the smallest tires that will come within our schedule of carrying capacities. Then, if the tires fail to deliver the service expected, the responsibility is at once automatically shifted to our shoulders, and we are expected to live up to our reputations for liberally taking care of our product. Suppose your sales agents order just the chassis and then have special bodies built—bodies too heavy in themselves, or so large as to permit the carrying of loads far in excess of those the tires are able to sustain without breaking down. What happens? Your customers soon have trouble with their tires, and they complain that the cost of maintenance is more than they had been led to believe.

The second kind of overloading is due to disproportioned equipment. Sometimes we find that trucks whose tire equipment, regarded as a whole, is ample for the service required, will be lacking in carrying capacity at one end, while at the other end there may be an excess capacity over the actual demands. I have in mind a case in which the proportion of weight carried by each axle showed that the front tires were considerably overloaded, while those on the rear had an excess capacity of nearly a ton. The owner of the truck protested his innocence, saying that he had never been told he was misusing his tires. The proper sized front tires applied, there was no further trouble.

The third kind, which is at once the most prevalent, the most illusive, and the hardest to cope with, is due to the improper loading of the truck. Sometimes this may be the result of faulty distribution of the load over the front and rear axles, which may cause the failure of the tires wholly without the knowledge of the owner. This is well illustrated in the case of a wholesale grocer whose custom it was to put all light packages on the front of the truck and save the heavy ones for the rear, with barrels of pork, molasses, sugar and kerosene on the tailboard.

In a coal concern the loose load was distributed in the truck body, and then the rear was piled up with bags of coal. In each of these cases the total load was within the combined capacity of the tire equipment, but not properly distributed.

The most difficult phase for the tire maker to overcome, however, is the deliberate placing on the truck as a whole too heavy loads for the tires to carry. The way is paved for the abuse even before your prospect has bought a truck. I refer to the temptation to which some of your salesmen yield to carry heavier and bigger loads than they should, when they give demonstrations before a prospective purchaser. When it becomes known that a man is thinking of buying trucks he is besieged by agents asking the privilege of giving demonstrations. A fierce competition then ensues to win the order, by showing how much merchandise may be moved within a given period, and how fast it can be carried. The result is that some of the loads carried in these competitions vary from 50 per cent. to 100 per cent. over the rated capacity of the tires.

The drawing of trailers is another means of improperly loading tires. No doubt this is an economical means of hauling, but trucks so engaged are placing a greater strain upon their tires, and they should be at least the next size larger than those which would safely carry the truck without a trailer.

Turning now to the effects of overspeeding on solid tires, I ask you to consider three things. They seem so axiomatic that they need only be mentioned briefly. First, overspeeding generates excessive heat in the tires, which tends to shorten the life of the rubber. Even though not overloaded, they may be driven so fast that they are burnt up, as it were, in a very short time. Second, it accentuates shocks and jars due to unevenness in the roadway. The stresses thus set up are really the equivalent of sudden overloads, and they tend just as effectively to cause the premature failure of the tires as though they were loaded beyond their capacity. Third, it induces the severe use of brakes, especially in thoroughfares in which there is much traffic. This in turn is apt to cause unnecessary friction with the road surface, which, of course, wears out the tires promptly.

Consumer Pays the Freight

Let us next consider who pays for these abuses. In guaranteeing the truck exclusive of the tires, the truck manufacturer conveniently arranges to "step out from under." The burden therefore seems to fall upon the truck owner or the tire maker, although I say frankly that the ultimate consumer bears most of the load. When tires fail prematurely the truck owner looks to us for an adjustment. Generally our salesmen have an accurate knowledge of the conditions under which such tires are operated, and if they have been overloaded we have taken occasion to warn the operator that we cannot be held responsible for failure to deliver normal mileage. Many users seem to feel that because their average loads do not exceed the rated carrying capacities of their tires they have not overloaded them, and consequently the rubber manufacturer should furnish other tires, free, to run out the guaranteed mileage. As there is no gauge by which the loads carried can be recorded, the tire maker has to accept the statement of the truck owner, or run the risk of an unpleasant controversy if he questions it. The truck is laid up—or perhaps merely the tire, if it is of the demountable type—and an adjustment or a rapid renewal is made, prematurely. Either method of settlement is more costly than continued service under proper conditions. The truck owner complains that the cost of maintenance is higher than it had been represented to him, although the chances are he had not been impressed with the high cost of overloading. You will admit that it is not sound business for a manufacturer to replace an article without due charge, if the user of the commodity has wittingly or unwittingly destroyed it. In self-protection, therefore, as well as for the education of the user, we stand our ground, and sometimes we have controversies through which we pay our share. We write letters, we send telegrams, we make personal calls and we send tires by express—all of which are expensive, and might have been avoided. Occasionally these contentions result in the loss of the customer, who decides to use another make of tire. In such cases, we feel that we have merely transferred an undesirable account to a competitor, who takes up the burden. Sometimes, however, for the sake of future business under saner conditions, we pay our part of the bill at once as a matter of policy. We make concessions which curtail the profit from the sale of the new tire, but as most users realize the advantage of renewing with a larger-sized tire, the business relations from that time on are upon a much more satisfactory basis.

But you truck makers also pay, indirectly, because you sell fewer trucks than you might, were it not for the unnecessarily high cost of maintenance which these abuses entail. I venture to say that at this moment your sales departments are all spending time and money trying to overcome the honest conviction on the part of several prospective purchasers that the chief reason for their not buying trucks immediately is, not their unwillingness to make the original investment, but their fear that the cost of upkeep will more than offset the saving to be gained through the use of your trucks. And the chances are that their principal concern is over the cost of tires. This idea has gained undue prevalence because of the unfortunate experience of many operators who have been obliged to pay for destroying their own tires by overloading and overspeeding them, whereas, if they had used tires large enough to perform their work economically, they would be enthusiastic advocates of motor delivery.

W. P. Kennedy spoke on maintenance guarantees, one of the most pertinent subjects that has arisen in the development of transportation. He stated in prefatory remarks that he did not believe that definite guarantees should be made as to performance and maintenance, but stated that there was a pronounced tendency on the part of some makers to favor guarantees of certain unknown quantities. Mr. Kennedy took up the analysis of truck service and treated it in exhaustive fashion. He classified the various parts of the automobile into divisions limited by the fact that they do or do not wear in service.

He said that if the maker of a truck is to stand sponsor for its service in the hands of the user he should have control of numerous elements that are now allowed to hang loose. In the first place, he should be able to say exactly what specifications should be called for in the truck that was to be used in attaining certain results. He also should have the deciding word as to the number of trucks to be used on certain work, and not only as far as the number of working trucks on a particular job is concerned, but also the number to be held in reserve. He said that the manufacturer should have veto power as to the employment of drivers, and should have an authoritative word as to the garage superintendent and the traffic management.

In estimating the cost of operation of electric vehicles as well as gasoline vehicles it is best to consider the subject under four heads, namely, Fixed Charges, Maintenance, Garaging and Operation.

Fixed Charges—These should include the interest on investment in vehicles and equipment and depreciation on the non-wearing parts of the chassis such as frame, axles, steering gears, springs, etc., at a figure which will provide a sinking fund for their repurchase when they become useless from a service viewpoint or obsolete. Actual practice in the use of electric vehicles in New York shows them in good serviceable conditions today after the machines have been in use over 10 years, and for this reason depreciation at 10 per cent. a year is fair.

Maintenance—Under the head of Maintenance comes the upkeep of tires, batteries and mechanical wearing parts of the machine. This should include not only battery material, new tires and new wearing parts for the car

required under normal service, but the charges for mechanical labor necessary in making these replacements.

Garaging—Garaging should cover garage labor due to storage, washing and the incidental attention which the vehicle needs in service, and also rent, light, heat, water, etc., as well as fire insurance, etc.

Operation—Operation covers such expenses as are incurred in performing delivery duty, as drivers and helpers' wages, accident and liability insurance, charges for loss and damage to goods during delivery, cost of additional delivery service in cases of exigencies, as well as licenses, etc.

David Becroft addressed the convention on "Civic Problems" which act as impediments to the present-day introduction of commercial vehicles in Chicago, and gave some suggestions as to how these might be removed by the co-operation of the truck manufacturers and truck dealers with civic organizations and the police.

Concerning coal delivery in the city of Chicago, M. E. Robinson, vice-president of the City Fuel Company, of that city, was quoted as follows: "When downtown buildings in Chicago are fitted with proper receiving facilities for coal delivery from dumping bodies, the coal dealers will adopt motor trucks exclusively. The motor truck is impractical for house-to-house delivery at present, but there is a big field in the loop district where dumping doors are properly fitted in alleys and sidewalks where dumping wagons can be used."

Mr. Becroft showed how, upon investigation of the coal situation in Chicago, it was discovered that frequently more time is lost in the coal loading yards in motor truck service than in the delivery fields. Coal loading yards are entirely under the control of the coal dealers, who have failed to install apparatus there to make motor trucks a success.

Eighty thousand tons of coal are delivered annually to the public schools of Chicago, yet a dumping body cannot be used in any of this work because the coal has to be unloaded into bins, the tops of which are 5 feet or more above the level of the ground. All of the coal must be shoveled off, and the cost of the shoveling alone amounts to \$8,000 per year. All of the schools are not fitted with 22-foot scales on which the load can be weighed, making it necessary to go to a particular school with a truck to weigh the load and then deliver to another school. Economy of delivery cannot be had with such facilities.

The relative speed of coal delivery by a motor truck as compared with horse delivery, when modern unloading facilities are offered, is shown in the following statistics of actual unloading at the Karpen Building, Chicago. With a 5-ton motor truck it required but 14 minutes from reaching the building until unloading was complete and the truck started again for the yards. With a horse vehicle, handling the same load, 37 minutes were required.

A great impediment to the successful operation of light commercial vehicles to office buildings in Chicago is the lack of adequate receiving and shipping facilities at such buildings. At the Heyworth Building, a 19-story office structure, actual figures on loss of time were taken. It required an express company motor vehicle 7 minutes to get from the entrance of the alley to the small unloading platform of the building, and 35 minutes at this platform to deliver three small packages to one office in the building. This loss of time was due to the expressman being compelled to waste time going up in the elevator to the office, returning again to the wagon for the packages, making delivery, and getting the necessary receipts. During this time other vehicles were waiting to reach the loading platform. These long waits could be eliminated by a shipping clerk for the building, who would have all packages in his office at a definite time, so that the express wagons could operate on schedule. By systematizing the collection of express packages through such a building an amazing amount of time and money could be saved.

Alley congestion is one of the biggest impediments to the economic operation of commercial vehicles in Chicago. A horse-wagon with three tons of coal has required 1 hour and 8 minutes to unload. This delay was due to having to shovel the coal through a small door in the side wall of an office building. All the vehicles behind were, of course, delayed. Were doors provided in the alley so that dump bodies could be used, this congestion would be eliminated. In Chicago a bond of \$10,000 is required where such doors are used, in addition to heavy rental costs, which makes it poor policy for buildings to fit such equipment. In some of the most modern buildings no provision is being made to permit of dump bodies being used. Truck manufacturers and dealers should take such questions up with the proper city and building authorities, and by so doing they will be working hand in hand with the police and others to eliminate undue alley congestion.

Cases were cited where 5-ton trucks required 40 minutes to travel 2 miles because of uncontrolled congestion. It is impossible to make a truck successful under such conditions.

American Cars in Foreign Test

PARIS, March 1—Five American cars—three Fords, a Reo and a Hupmobile—are among the sixty-two contestants which started this morning in the 240-mile reliability test around France, which will last 20 days. The affair is promoted by the Automobile Club of France and is in daily stages of 270 miles each, with the average pace 18 1-2 miles an hour. The contest is far from being strenuous—more like last year's American Glidden—being more in the nature of a selling demonstration than a technical competition. All the drivers are called upon to do is to maintain the average pace set by the club. The route that is being followed takes in Nancy, Dijon, Lyons, Grenoble, Nice, Marseilles, Narbonne, Toulouse, Bordeaux, Nantes, Rouen and Amiens.

Hispano-Suiza and Fiat Entered

PARIS, March 1—The number of entries for the Grand Prix race organized this year by the Automobile Club de France has reached fifty-eight, the Fiat and Hispano-Suiza companies each sending a team at the double fees required for all entries received after December 31, 1911. There are thirty-three of the cars in the light-car and twenty-five in the unlimited class.

S. A. E. Discusses Guarantee

Subject of Carbonization Also Taken Up— Organizing New York Accessory Trade —Plummer Heads Dealers

Moross and Wellman Disqualified for 2 Months—John Wetmore Operated Upon

FOLLOWING the election on the night of March 1 of Joseph A. Anglada as chairman, A. J. Slade as treasurer and J. C. Chase as secretary of the Metropolitan section of the Society of Automobile Engineers for the ensuing year, two topics of live interest were brought up for discussion. The first of these was the subject of service guarantees for commercial vehicles. There seemed to be considerable difference of opinion as to what should constitute a guarantee. For the most part, the discussion was from the manufacturers' standpoint.

It seemed to be generally held that the demand for service guarantees from reputable makers will fade gradually as the industry assumes more and more of a solid basis. There is no service guarantee imposed upon the maker of other classes of machinery, and Mr. Slade's view that it seems unbusinesslike to exact a guarantee from the maker as to results when he has no further control of the product was also held by a number of the others in attendance.

The largest users of commercials do not demand guarantees from the makers. Examples of this class are the express companies and the big commercial houses. They investigate the proposition thoroughly before they place their order, and that ends it. There should, however, be a guarantee to cover defective material and design over a period of years, in the opinion of several of the members, and any reputable truck maker is willing to give such a guarantee.

Some of those present disagreed with this as to material and design, they believing that the latitude is too great, and that it would not be fair to come back at the manufacturer after 2 or 3 years just because during that time he has made improvements.

It was also stated that the maintenance guarantee is a commercial one and should be given if the purchaser desires it. The cost of the vehicles under such a contract, however, would be considerably greater.

The matter was looked at from the angle of the sales department, and all agreed that the salesman and the engineers who have designed the product should be at one as to what the machine can and will do. The intending purchaser is oftentimes more apprehensive as to the car's meeting the claims which have been made for it by the salesman than he is as to its mechanical construction.

Several rather unusual forms of service guarantees were brought up and discussed, after which the subject of carbonization in motor cylinders was taken up.

Forrest A. Heath was the principal speaker on this topic, he explaining very fully the reasons for carbonization in cylinders. The principal source of carbon deposits, he said, was in the improper chemical combination of the hydrogen and oxygen in the combustible mixture. To secure the correct chemical union the two elements must be evenly diffused through the air, and when this is not the case large globules coke out into chunks which deposit on the cylinder heads and valves. This is due largely to the way throttles are handled, since for slow speeds all carbureters have to be adjusted more rigidly than they should be. This excess material must separate out.

Inasmuch as several of those well informed on the subject who had been asked to attend the meeting and enlighten the members as to carbon prevention were not on hand, very little of value was brought out on this phase of the subject, although the drawing in of road dust was discussed.

Gotham Accessory Trade to Organize

Under the leadership of J. C. Nichols and a group of prominent members of the automobile accessory trade of New York, the proposed organization of the trade is progressing satisfactorily. A series of meetings has been held and a definite organization, something in the nature of a club, will probably be announced during the month.

In outlining the project, Mr. Nichols said: "The club will undoubtedly be formed and will be largely social in its character. Of course we shall discuss credits and other matters of business, but great care will be used to avoid contact with the Sherman law and kindred statutes.

"Heretofore there has been little co-operation between the various members of the trade and we hope to correct such tendencies in the new organization.

"The Automobile Club of America may be asked to join this movement, as the business of the club has been one of the bones of contention in the trade for a long time. I understand that the club has been able to purchase practically everything from the local trade, but there was a time when the trade did not make any price concessions to the club. Then we discovered that one company would sell a line of goods and then another. Soon almost every concern in the sundry business in New York was bidding for a piece of it and finally the club was able to purchase everything except Klaxon horns and Weed chains from the dealers.

"In order to show how the dealers cut their own throats, I have only to say that with one or two exceptions, every member of the trade wrote to the Klaxon and Weed people asking permission to sell the club.

"In order to do even justice to all, the factories took over the business themselves.

"Just what will develop from the Automobile Club of America situation cannot be known until after the results of the present conferences between the various factions of that club have been settled."

Plummer Again Heads Dealers

John F. Plummer, Locomobile Company of America, was again chosen to head the Automobile Dealers' Association, of New York, at the recent meeting of the directors of that organization. Frank Eveland, of A. G. Spalding and Brothers, was elected vice-president, succeeding Sidney B. Bowman, and C. P. Skinner was re-elected secretary and treasurer. The remainder of the board consists of the following: M. J. Budlong, R. D. Garden, H. M. Bronner, H. S. M. Mead, C. M. Brown, A. L. Newton and A. M. Day.

John Wetmore Undergoes Operation

John C. Wetmore, known as the dean of automobile writers in New York, was operated upon Saturday to reduce an abdominal hernia from which he has been suffering ever since bicycle days. "Uncle John," as he is generally known, stood the operation well, but it proved to be of such considerable duration that he was much exhausted after coming from the operating room.

Mr. Wetmore is automobile editor of the *Evening Mail* and has achieved a position of national prominence. His condition is not regarded as alarming.

Well-Known Promoters Disqualified

E. A. Moross and W. H. Wellman were disqualified for 60 days as the net result of the abandonment of the race meeting at New Orleans, which was scheduled for February 17-18. Moross applied for a sanction for the meeting and it was granted, but the event was not run off.

The suspension expires April 20. The rule under which the Contest Board of A. A. A. acted is section 21, which forbids the abandonment of any contest after entries have been received for it, except where the referee orders postponement.

Standardizing the Electric Alexander Churchward Discusses Subject of Speed in This Connection—Trucks Must Not Run Too Fast

Boosting the Lincoln Memorial Road from Washington
to Gettysburg

IN A PAPER entitled "The Standardization of the Electric Vehicle," read before the Electric Vehicle Association of America at its monthly meeting in New York City on February 27, Alexander Churchward dwelt upon the problem of maximum speeds as applied to the electric vehicle. The relation of low speed as a decided factor in giving a low cost of maintenance was especially emphasized. This matter was taken up both from a commercial and pleasure standpoint. This is the second paper on this subject, the first of which was read last year, dealt with the standardization of the voltage. The gist of the remarks made by Mr. Churchward follows:

"The speed of the electric vehicle has been increased from year to year. And the real cause for this increase is not that the engineer of any one company has found some new battery, motor or tire, but because the salesman finds it easier to dispose of a car which will go faster than that of his nearest competitor.

"Now the real claim for the electric pleasure or passenger vehicle is that it is so simple, reliable and easy to operate that any child or woman can run one. But when you stop to consider that one of these glass-inclosed vehicles weighs nearly 1 1/2 tons, with passengers, and is capable in some cases of making 25 miles an hour on good level roads, do you not think that the speed is too high for the vehicle to be properly controlled by a woman or child? Twenty miles an hour I consider very fast, yet the braking strain is 56 per cent. greater at 25 miles than at 20 miles.

"I have talked this matter over with many of the older and long-established manufacturers and they would welcome some standard maximum speed, providing that the different companies would stand by it.

"Now, in regard to the effect of speed on the energy consumption of a vehicle, I have made some interesting tests.

"At first our tests were made with the ordinary voltmeter, ammeter and stop-watch over a measured course. These were not entirely satisfactory, so that we had to design and build a graphic recording instrument.

"We were able to obtain very accurate results and by combining the road test with a dynamometer test in the factory we were able to separate the various losses due to tires and windage.

"From the tests it was noted that the power required rose very rapidly as the speed is increased over 17 to 18 miles per hour. This is true even with large cars weighing 16 tons and designed to run on rails. I would, therefore, suggest the following speeds for electric pleasure vehicles, and would say that the table was prepared after talking the matter over with different manufacturers within the past month:

"Closed Type Coupé—19 miles per hour pneumatic tires 18 miles per hour solid cushion tires.

"Open Victoria Type—20 miles per hour pneumatic tires; 19 miles per hour solid cushion tires.

"If, however, you really want to ride fast, then build a car having a minimum wind resistance, such as the torpedo type. One little car of this type has a record of a mile in 59 seconds; the battery equipment was twelve cells, weighing 300 pounds, the motor 100 pounds.

"I will now take the subject up from the commercial vehicle side. We all know that for city and for moderate hauls the electric vehicle has arrived, due solely to its reliability and

low maintenance. And the one reason for this is the moderate speed at which it operates. If the gas car manufacturers awake to the fact that high speed means high cost of maintenance, then there will be some competition in the short-haul field.

"The effect of high speed on commercial vehicles fitted with solid tires is well shown by curves plotted from tests made by Michelin.

"At the summer meeting of the S. A. E. a short paper was read on the energy consumption of vehicles and gave a table of speeds for various weights of cars as follows:

Gross weight	Tires	Miles per hour	Gross weight	Tires	Miles per hour
1,500	Pneumatic	20	4,000	Solid	13
2,000	Pneumatic	20	5,000	Solid	11
3,000	Pneumatic	18	7,000	Solid	9
4,000	Pneumatic	16	10,000	Solid	8
2,000	Solid	16	15,000	Solid	7
3,000	Solid	15	20,000	Solid	6

"Within the last month I have again taken this matter up with a number of manufacturers and a compilation of their speeds is given below:

Carrying capacity	Speed, miles per hour	Carrying capacity	Speed, miles per hour
1,000 pounds	12-13	3 tons	7-8
2,000 pounds	10-11	4 tons	6.5-7.5
3,000 pounds	10	5 tons	6-7
2 tons	8-9	6 tons	6.5

"A 3-ton truck to compete successfully with horses does not have to run at touring-car speeds. The average speed of a 3-ton horse-drawn truck will be about 2.5 miles per hour, and the mileage not over 12 to 15 miles per day. Therefore a 3-ton truck running at 7.5 miles per hour will compete very successfully with the horse-drawn vehicle, and its maintenance will be low.

"The maximum speeds must be kept down in order that the electric vehicle will continue to hold the enviable position it does today, viz., that for city work and short hauls it is the cheapest and most reliable method of mechanical traction."

For Washington-Gettysburg Road

WASHINGTON, D. C., March 5—The congressional committee on the library today gave a hearing on the Borland bill empowering the Lincoln Memorial Commission to plan and design a national highway from Washington to Gettysburg.

The American Automobile Association was represented by President R. P. Hooper, George C. Diehl and A. G. Batchelder.

General John R. Black told the committee it was the dream of the members of the Grand Army of the Republic to see a highway extending from Gettysburg to Richmond, and passing through the national capital.

Replying to statements that had been made to the effect that the cost of the proposed highway would be \$34,000,000 and that it would cost \$3,000,000 annually to keep it in repair, George C. Diehl declared the statement to be wildly extravagant and not based on facts and figures. He estimated the cost of a 40-foot road with a 24-foot strip of macadam, treated with a bituminous binder, at \$20,000 a mile. This would make the cost of the seventy-two mile stretch about \$1,500,000 and the cost of maintenance would be \$750 a mile, including the renewal of the surface of the road every 10 years.

Syracuse Club Expelled from State Body

SYRACUSE, N. Y., March 2—Following the action of the Automobile Club of Syracuse in refusing to longer affiliate with the New York State Automobile Association, the club has been formally expelled.

The local club objected to the amount of the dues assessed upon it by the State body and had failed to qualify in good standing for quite some time. It claimed an unjust discrimination in that it was supposed to pay as large dues as clubs in the state far larger than it and thought it could use this money to better advantage.

Accessories

Seen at Boston's Show

B

OSTON has the accessory show of the year in one respect, while in another a different view may be taken. The fact that the Motor and Accessories Manufacturers, the national organization of makers of accessories, took all the available space and placed it at the disposal of their members would indicate that this organization looked upon the Boston exhibition as the national accessory show of the year. On the other hand the number of accessory exhibitors in Mechanics' Hall, at Boston, is less than the number at Madison Square Garden, New York, or at the Coliseum, Chicago. Another curious fact is, that although the Motor and Accessories Manufacturers took all the space, but 100 of the 258 members exhibit in Boston, while there were 150 at Madison Square Garden and 140 at the Chicago show.

After the members of the manufacturers' association selected the space required for their exhibits, the matter was turned back to the show management, who disposed of space to an additional 100 exhibitors, which brought the total up to 200. The total number of exhibitors at the Madison Square Garden show was 329. The difference in numbers may be accounted for by the fact that there were certain lines which do not exhibit at Boston. Conspicuous among these were the manufacturers of parts such as axles, wheels, makers of pressed steel work, springs, ball and roller bearings, etc. In a word the show does not appeal to the car manufacturer so much as it does to the garage manager, dealer, agent and private car owner. This is well shown by the fact that 3,000 New England members of that part of the trade just mentioned have received special invitations to attend.

Another thing which shows that this is essentially a dealers' and not a manufacturers' exhibition is the fact that in spite of the great number of individual

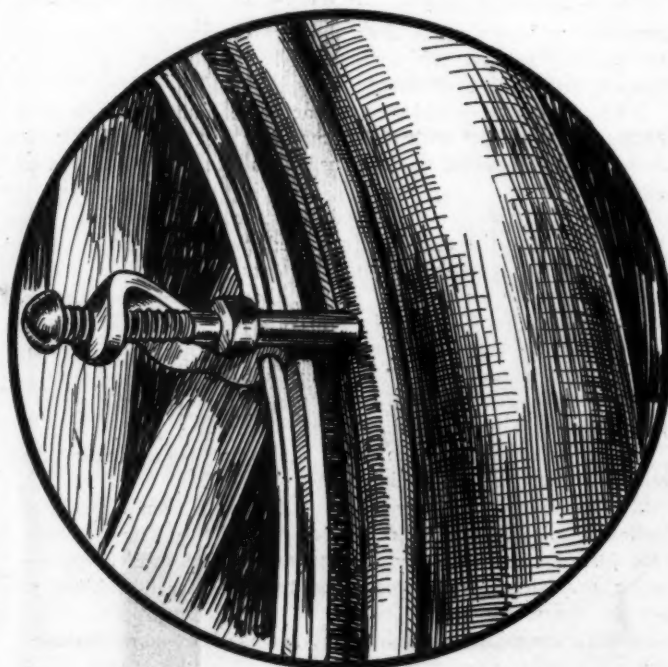
cars shown—more than at New York or Chicago—only the names of the Boston dealers appear and not the manufacturers. That this is not the case with the accessories is due to the fact that the members of the Motor and Accessories Manufacturers have secured half of the space devoted to accessories.

Worthy of note is the fact that New England, the home of factory machinery, is producing machines for garage use in increasing numbers. This year the exhibits of the concerns which have turned their attention in this direction are conspicuous. More than half a dozen spaces, all of which attract the greatest interest, are utilized by the machinery makers to show their drills, grinders, lathes, sheet metal cutters, screw machines, etc., in operation. Exhibits such as these attract attention because they are instructive. The public seeks to be taught. This is the main reason that shows are so well attended and in this way the eventual buyer learns what to demand. Beyond their instructive value, these exhibits broaden the scope of New England's greatest field—factory machinery.

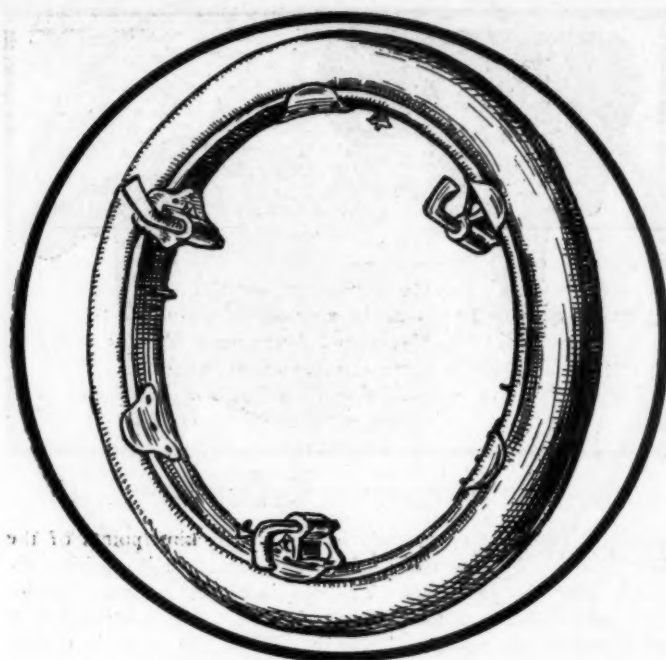
In the descriptions of accessories which follow are included some which are not exhibited at the Boston show, but which have not been described in previous issues of THE AUTOMOBILE:

Wm. L. Tobey, Boston, Mass.—The Tobey rim remover is intended to make the removal of Universal or Firestone Q. D. tires easy. The remover is inserted at the joint of the locking ring of the tires and when the clamp nut is removed from the valve stem and the latter forced up the rim, turning of the screw forces the clincher ring from the normal position, over the locking ring, to the position shown in the accompanying illustration. Thus the locking ring may be easily removed. In putting on a new tire the inner tube should be sufficiently inflated to prevent nipping and then it is forced on the wheel rim.

George E. Armstrong, New York City.—The Hercules Suspension Tire is of solid rubber backed up by a series of heavy steel coil springs. These springs are arranged between



The Tobey Q. D. rim remover



The Jenkins emergency wheel

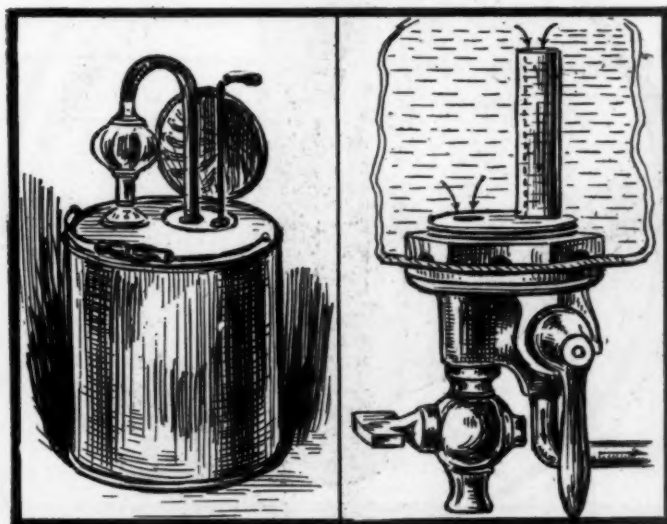
the tread and a sort of inner wheel. The spokes are only in the inner wheel, their place being taken by the coil springs for the remainder of the distance. The springs are so arranged that the weight is carried on half of them, while the remainder are utilized for absorbing the road shocks. The springs are arranged tangentially to the inner wheel and are fastened firmly thereto and also to the felloe of the outer wheel.

Jenkins Emergency Wheel Company, Richmond, Va.—The Jenkins emergency wheel is made by this concern. Three lugs and nuts form the means by which it is attached to the wheel upon which the tire is damaged. These lugs engage with the permanent wheel. When attaching the emergency wheel it is not necessary to touch the injured tire and there is nothing about the wheel that can damage the punctured tire in any way.

Planet Company, Westfield, Mass.—Duplex automobile foldables, including pails, funnels, trunks and tool cases, are specialized. The pails have splash guard strainer and spout which allows the water to be gathered from inaccessible places, such as streams, etc. There are two sizes in which the pails are made, one holding 6 quarts and the other 10. The material

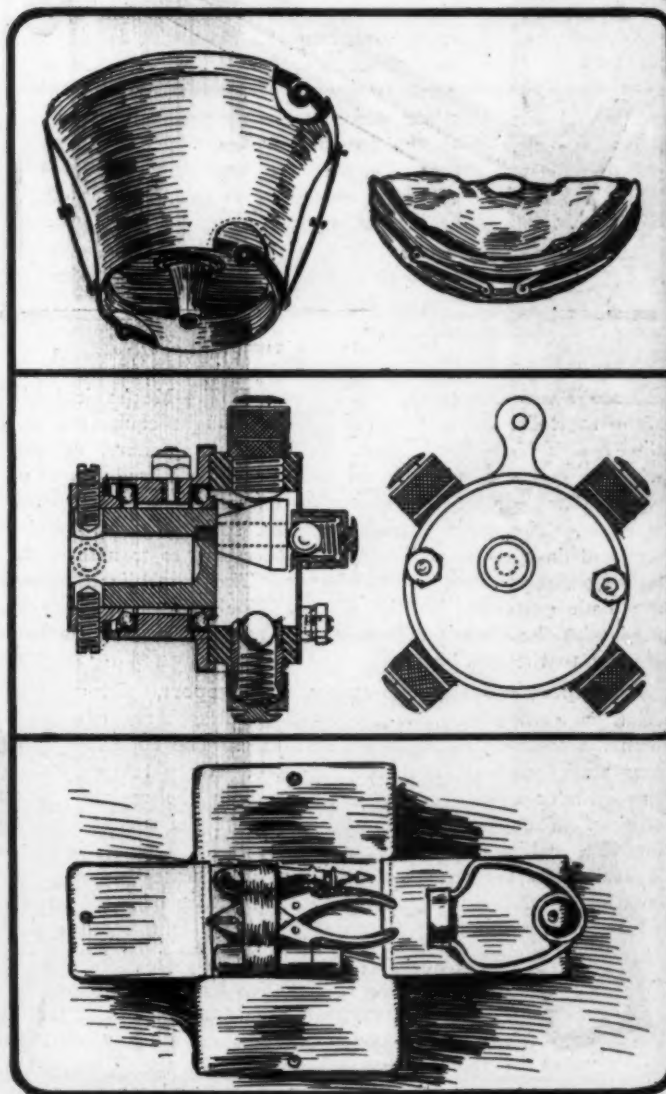
used is heavy brown waterproofed canvas. The folding funnels are 7 1-2 inches in diameter and 5 1-2 inches deep when in use. They fold into a space of 7 1-2 by 3 1-2 by 1 1-2 inches when stored. The folding trunks are in two sizes, both being 24 inches diameter at the top and 22 inches at the bottom, the larger of the two is 8 inches deep, while the smaller is 6 inches deep. The material used in the trunks is heavy black leatherette; the metal parts are of rust-proofed spring steel. The larger trunk can be folded into a space of 24 by 12 by 4 inches and the smaller 24 by 12 by 3 inches. The Planet automobile tool case is made of heavy brown waterproof canvas and heavy leather. There are compartments for every necessary tool. When the tool case is opened any of the tools may be seen at a glance and that desired abstracted without the necessity of disturbing any of the others. The side flaps of the case cover the tools perfectly and when wrapped up the tools are protected from the encroachments of rust.

Zwilling & Feldman, New York City—The Sentinel gasoline tank alarm is to prevent running out of gasoline on the road. The tank is fitted with a 3-inch wide standpipe in the bottom, through which the gasoline flows to the carburetor. When the level of the standpipe is reached, the gasoline will cease flowing and the result will be that until the gasoline can flow through a lower outlet by means of the turn of a handle the car cannot go. The standpipe height is such that the gasoline which remains in the tank will carry the car 10 miles.

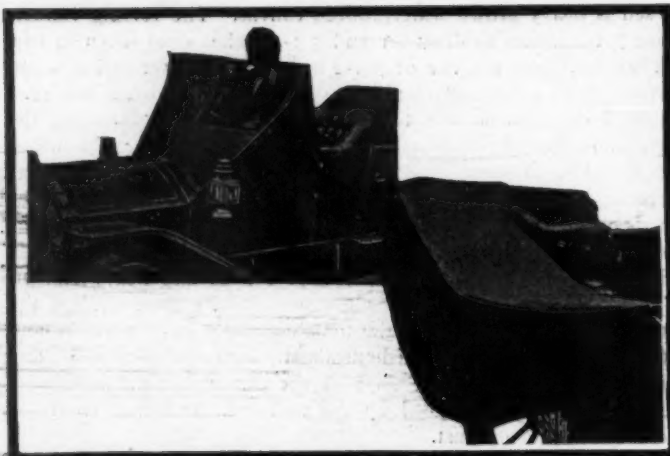


The Nesco combination pump and oil can for small garages

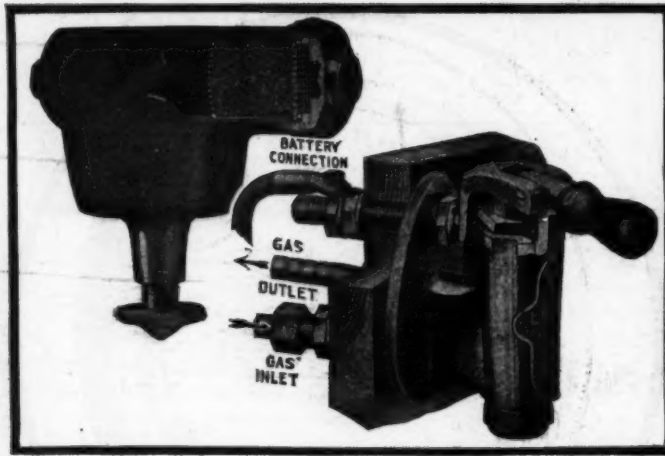
The Sentinel gasoline tank alarm which warns of low fuel



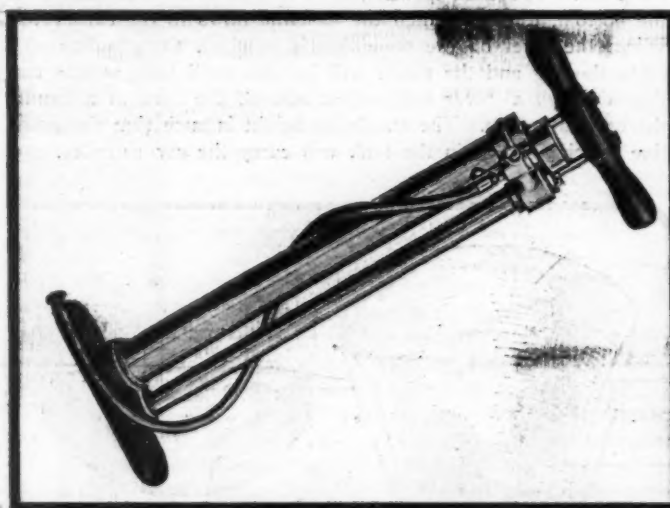
Duplex automobile pail—open and closed. Sectional views of the Bemus ball-bearing timer. The Time-Saver repair kit—open



National windshield—Apco slip cover



Ellis gasoline purifier—Flash auto lighter



Atlas auto tire pump

Auto Parts Company, Providence, R. I.—Mechanical oilers with leads, valve-spring covers, searchlight equipment and slip covers for Ford cars; and also accelerators, exhaust whistles, etc., for any cars are made under the trade name of Apco. The searchlight system uses current from the flywheel magneto. The outfit consists of bulbs, sockets, wires, converters and dash units, and everything necessary to transform the lighting system from gas to electric. The parabolic reflectors are made especially for the system. The same lamps may be used with the electric system, the electric bulbs being clamped directly to the gas burners.

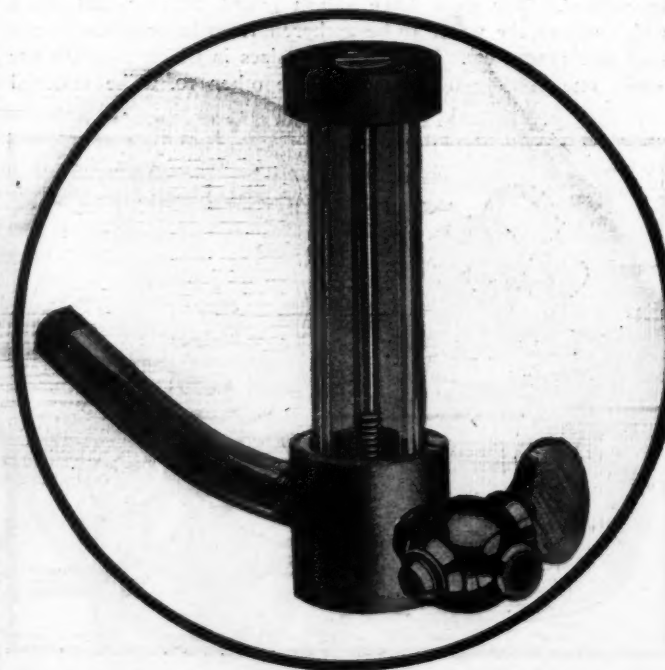
Bridgeport Brass Company, Bridgeport, Conn.—The Atlas is a compound, double-barrel seamless brass tire pump with non-leakable joints and a cast base. The buckets or pistons are specially treated and hardened. Air is taken through the cylinder cover and delivered on both the up and down strokes. The pump is of open-top design, the cone being removable, making all parts readily accessible. A gauge is fitted if desired by the purchaser, at a slight increase in cost. Dimensions of Atlas pumps are as follows: Size of large barrel, 1 1/4 inch; size of small barrel, 7/8 inch; length of stroke, 15 1/2 inches; length of rubber tube, 24 inches; weight, 5 1/2 pounds. The Stapley pump is a single-cylinder pump.

Motor Specialties Company, Boston, Mass.—A. B. C. jacks, Flash auto-lighter and a complete stock of other accessories are handled by this concern. By means of the Flash auto-lighter, which comprises special burners, coil and controller, the gas lights may be ignited or the light turned off as readily as if the lights were electric. The burners are made to fit any

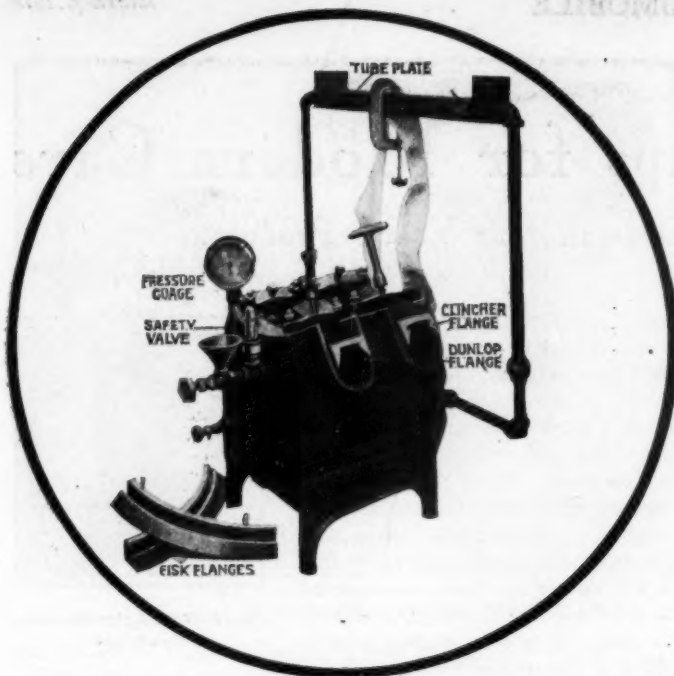
standard lamps; they are provided with sparking points of the best quality of heavy spark wire rigidly clamped in position directly over the gas vents. The coil is of the ordinary single-unit type finished in mahogany and brass. The controller is a combination gas valve and switch. When the lever is turned to the "on" position a spark jumps at the burner and the gas which has been turned on at the same time is ignited.

National Auto Top Company, New York City—Auto windshields and mohair fabric tops are specialties. The windshield is so designed that the driver looks over instead of through it. The currents of air are deflected over the driver's head when using this shield. The panels are of celluloid and the trimmings of brass. There are detachable side curtains and a roll-front for summer use. Glass windshields are also made in ornamental designs for high-priced cars.

National Sales Company, Boston, Mass.—The Ellis gasoline strainer is designed to take water and any other foreign matter out of the gasoline and collect the water and sediment so that they can be drawn off. The gasoline passes through a small cylinder filled with quartz, felt and two fine screens whereby all dirt and small particles of paraffine are caught and held. The strainer may be removed from the gasoline line for cleaning purposes.



Model T Ford oil gauge for 1912



Hartford sectional vulcanizer

Hartford Rubber Works Company, Hartford, Conn.—The Hartford sectional vulcanizer is designed for making permanent repairs on tires which have either been temporarily repaired or not repaired at all. The vulcanizer is very complete and any tire may be repaired with it. The moulds are built directly in the machine so that the owner is prepared to do any kind of vulcanizing on any kind of tire. It is suitable for public or private garages, the size being such as to make it not suitable for roadside work.

Shore Instrument & Manufacturing Company, New York City—The Shore instruments are for testing the hardness of materials. The Sico Yield Gauge is used for testing the flexibility of rubber, leather and compositions having a like nature. The instrument resembles a pressure gauge in appearance with a blunt piece of metal in place of the connection tube. When the point of the metal is pressed against the material it causes it to yield a certain distance. This yield is indicated by the figures on the gauge and gives a clue to the comparative softness of different materials. When the indicator is not in use the hand rests at 100. The readings are all given in parts of 100; the highest possible point on the scale is zero. When the indicator reaches a figure it indicates that the resistance to yield is equal to that percentage. A good tire will show about 55 per cent. yield, while a poor one will show about 35. The Shore sclero-

scope for measuring the hardness of metal and the pyroscope for measuring heat are familiar to our readers.

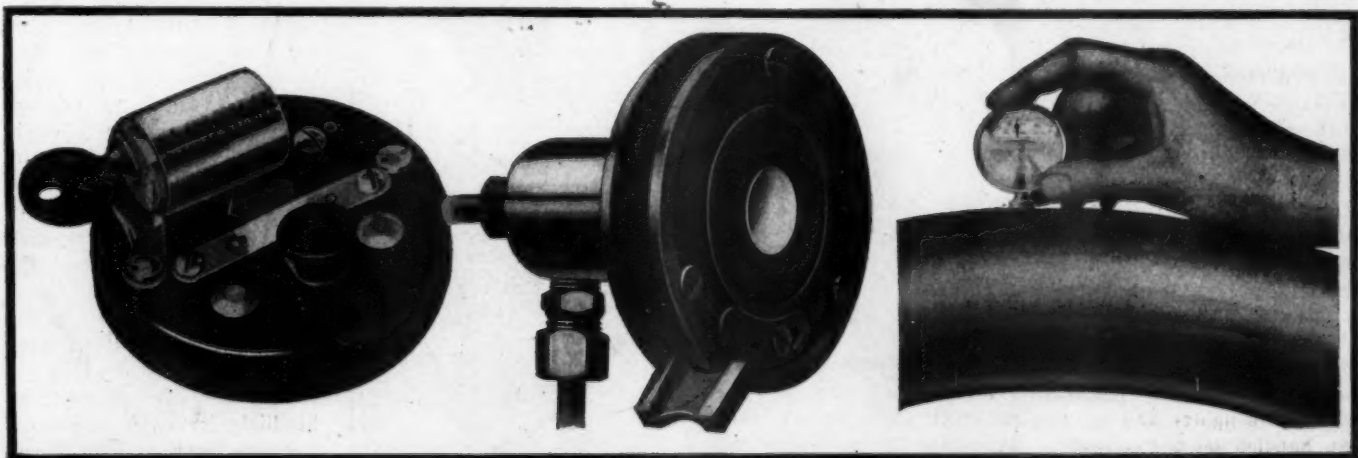
Sireno Company, New York City—The Sireno is the largest of the horns made by this concern. It is a motor-driven signal and may be operated very readily from the 6-volt ignition system. The Sireno Junior is similar in design to the Sireno but smaller. A 6 or 8-volt current may be used to operate this signal. Special switches and horn projectors are also made by this concern. The sound is produced by a rapidly rotating turbine actuated by an electric motor.

William N. Stacey Manufacturing Company, Springfield, Mass.—The Perkins lighting system is made by this concern. The system consists of three parts, a gas pressure regulator, flame igniter and flame controller. The pressure regulator controls the flow of gas from the tank, to which it is fixed. The gas pressure is reduced from 225 pounds to 2 ounces regardless of the number of lights in use. The regulator is circular and is equipped with a regulating screw by means of which the pressure may be varied as desired. The flame controller fits on the dash and is so arranged that the lights may be made bright or dim, lighted or extinguished at will. The controller is a small circular switch with the finger lever at the bottom. The quadrant through which the lever moves is divided into three points marked: Off, Low, On. The flame igniter is a low-tension sparker which is clamped directly to the burner of the gas lamp. When the current is switched on a piece of metal vibrates and makes and breaks contact at the burner. An electric arc is drawn each time the igniter breaks contact, thus lighting the escaping gas, which is turned on simultaneously with the igniter, by a movement of the dash flame controller.

(Continued on page 672.)



Marine type of the Sireno Junior



Auto-lock switch-plug

Perkins lighting system

Sico tire yield gauge.

Making Modern Lamps for Modern Cars

Simplicity the Main Development in This Year's Product

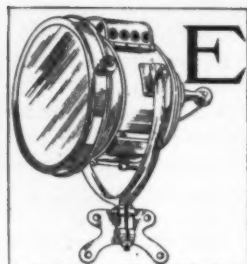


Fig. 1—B. and L. Swivel Searchlight

ELECTRICITY for the illumination of the car has struck a popular chord. The great advantage which it possesses, viz., that the lamp may be ignited from the seat by the simple pressure of a button, appeals greatly to the progressive motorist. Not to be outdone, however, the makers of acetylene lights have perfected the electric lighter so that gas lamps, too, may be lighted from the seat just as readily as those of the electric type. Beauty of lines in both these types of lamps, as well as in

the oil lamps, is noticeable in this year's product. Metal spinning has nowhere reached a better result than in the simple and effective styles that are now seen on every car.

In making the lamp, the first step after the production of the sheet metal is one of stamping the material roughly to form, in a large die. After this is done the metal spinner mounts the roughly-shaped piece upon his machine, over a form and sets it in rapid motion. The work revolves toward him. While the machine is in rapid motion a metal piece is taken by the operator and pressed firmly against the spinning metal. This presses it against the form and owing to the rapidity of motion and the fact that the operator uses a rest against which the tool is laid, an enormous pressure may be brought to bear upon the metal, pressing it against the form so that it finally takes the desired shape. After the completion of this operation the lamp is removed and placed in a finishing die. The polishing and buffing operations are the next in order, the final step being in the fitting of the lens. The lens is generally placed into the lamp in vertical strips to avoid cracking under the unequal heating which it is called upon to bear.

The finest lenses, and those which are in common use in the best lamps, is the lead white glass. There is no green in this glass and the absorption of the rays is reduced to a minimum. Next in importance to, or it may be said just as important as the lens, is the reflector. Regardless of how good the lens may be, its effectiveness is destroyed without a good reflector. This important part of the lamp is made in the same manner as the body. After the spinning and die operations have been completed, however, it is silver-plated and then polished highly. In one lamp made by the Aplco Electric Company a glass reflector is made under the name of Golden Glow. These reflectors are of para-

bolic shape. The parabola is a mathematical curve which is generated by a point moving along a path which is always the same distance from a fixed point and a given line. The fixed point is called the focus of the parabola. When the parabola is spun about its axis, the surface generated is of parabolic shape and possesses the peculiar property that it will reflect any light concentrated at the focus, in a line parallel with its axis. It is thus evident that in either a gas or electric light, in order to get the long straight beam of illumination it is necessary to concentrate the light at the focal point. This cannot be done completely on account of the width of the flame, so that there will be some of the light reflected to either side of the vehicle. This is greatly to be desired, as a certain amount of this side illumination is necessary.

Viewing the improvements in headlight design, the most important feature noted is the increase in the plain smooth types. The exterior surface of the lamp may be readily kept clean when this construction is used and at the same time the shape of the lamp is almost ideal in conjunction with the straight-line type of body now universally adopted. In the electric lights, the acorn shape is interrupted only by the entrance points of the wires and the brackets fitted for the support of the lamp, while in the gas lamps, which require vent holes in order that the combustion of the acetylene may be maintained, simplicity has also been made a prominent factor in the design.

In the case of the Ford cars, where the ignition is effected by a magneto in the flywheel of the motor itself, the ordinary electric lighting systems cannot be readily adopted. For this reason, during the past season there have been many systems brought out which are specially adapted for these cars. These use the Ford magneto and have been found to be very satisfactory in this connection. The other types of electric lighting systems are numerous and are generally adapted to any type of car.

The lights of the car which may be considered of the highest importance are the headlights. These find their greatest use in the country, where the roads are very apt to wind. The advantage of the headlight is that it will throw a strong beam of light ahead, enabling the driver to perceive the bends in the road at a great distance. In country



Fig. 2—The Aplco Electric Headlight



Fig. 3—(Upper) Cowley tail light; (center) General Electric Company's round lamp; (lower) English & Mersick side lamp and reading lamp for use in the interior of closed cars

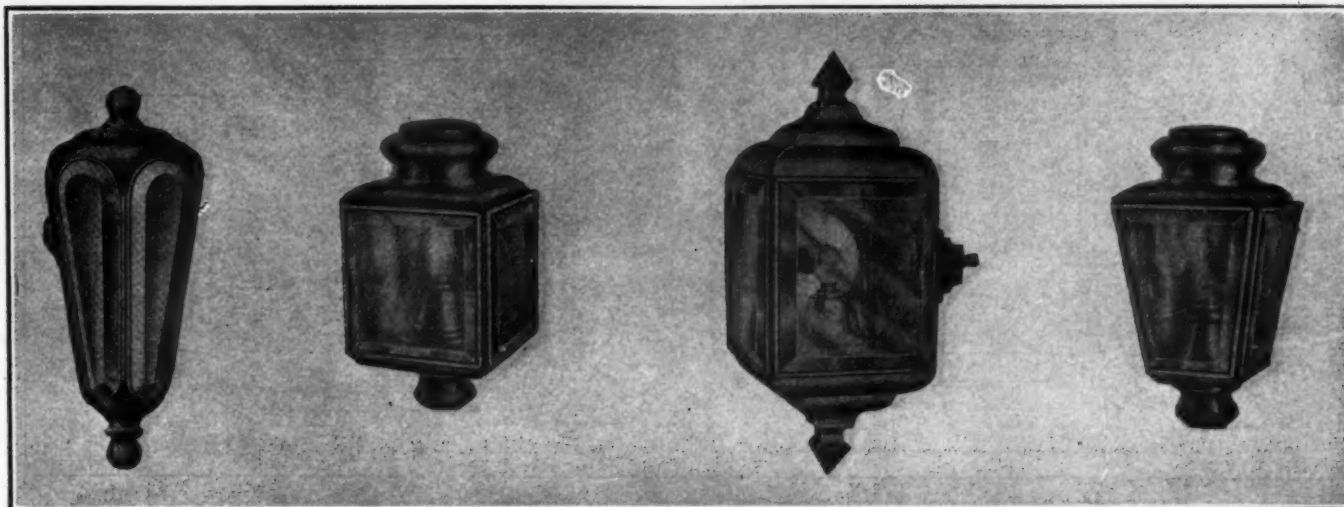


Fig. 4—Solar hexagon limousine lamp. Vesta side lamps in three popular square types

touring obstructions are often found in the road which would not be perceived with a weak lamp until the car is too close to the object to escape without colliding with it and sustaining serious damage. This is especially the case after a severe thunderstorm during the summer months. It will very often happen at this season of the year that there are small washouts which occur along the dirt roads which are so frequently found on such prominent touring grounds as Long Island. Another thing which has caused trouble in many instances after a thunderstorm are the branches which have been broken from the trees which border the roads and which lie across the path of the machine. A strong ray of light is required to enable the driver to perceive either of these objects as they are of such a nature that they will merge with the background unless strongly brought into relief by a beam of light of great penetrative power.

Development of the Gas Lamp

GAS lamps first made their appearance for bicycle use, and the owner of one of these new types of lamps, which partially succeeded the oil lamps, was supplied with a clear white light far superior to the rather dim, yellowish glow given forth by even the best of the kerosene lamps. The acetylene is gener-

ated by allowing water to come into contact with calcium carbide in a generator which in the case of the bicycle was attached to the lamp itself, the two making a very handy and compact plant and one which gave very good satisfaction and a very bright light. The greatest objection was found to be the frequency of cracked reflectors. With the appearance of the automobile it was but natural that the gas lamp should be fitted to the new vehicle and this was done with great success. The gas lamp of today with either its generator or storage tank is a very complete and trustworthy plant and one on which the troubles have been minimized.

The use of magneto and storage battery for ignition and starting purposes would naturally lead to the very convenient electric lighting plant, for by slightly increasing the capacity of this plant the possibility of making a lighting plant which should possess all the advantages of electricity was readily recognized. Many attachments have been brought out whereby the gas lamps are readily converted into electric lights. Some of these are shown in the accompanying illustrations.

The functions of the headlight involve a very difficult and intricate method of focusing the lights. There are really two features of the lights which have to be carefully carried out, if

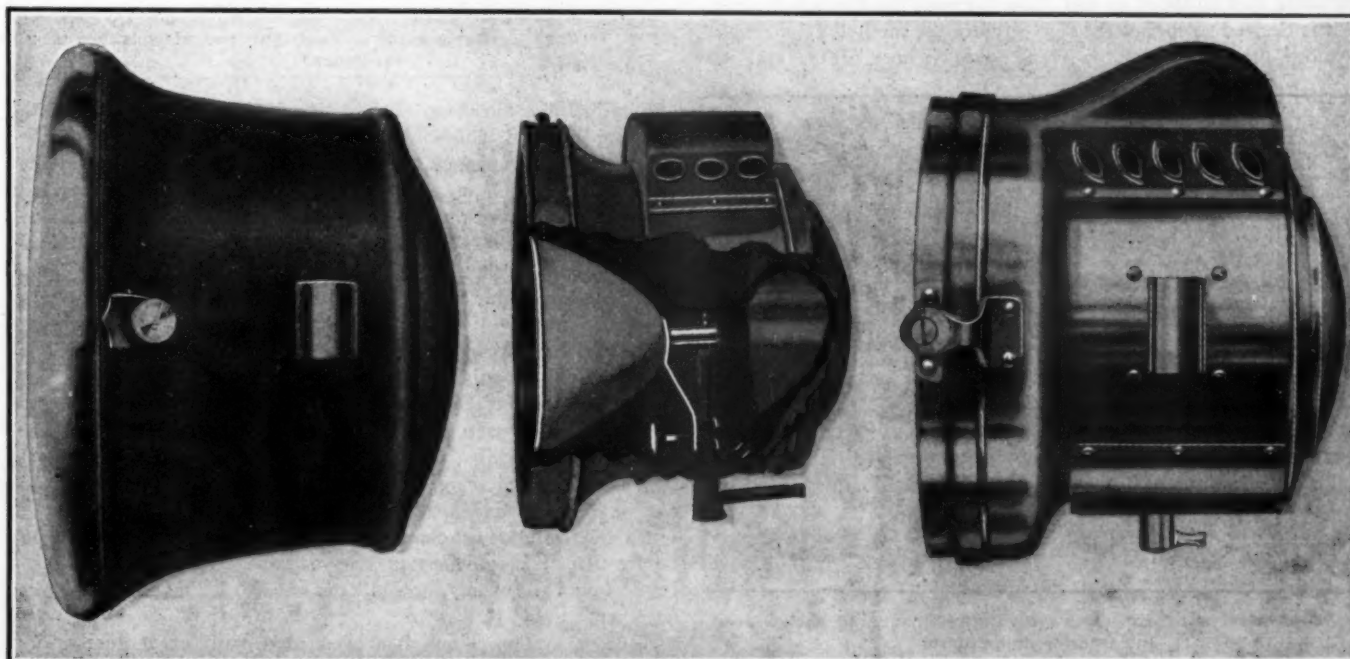


Fig. 5—Edmunds & Jones electric headlight. C-S gas attachment. Edmunds & Jones gas headlight

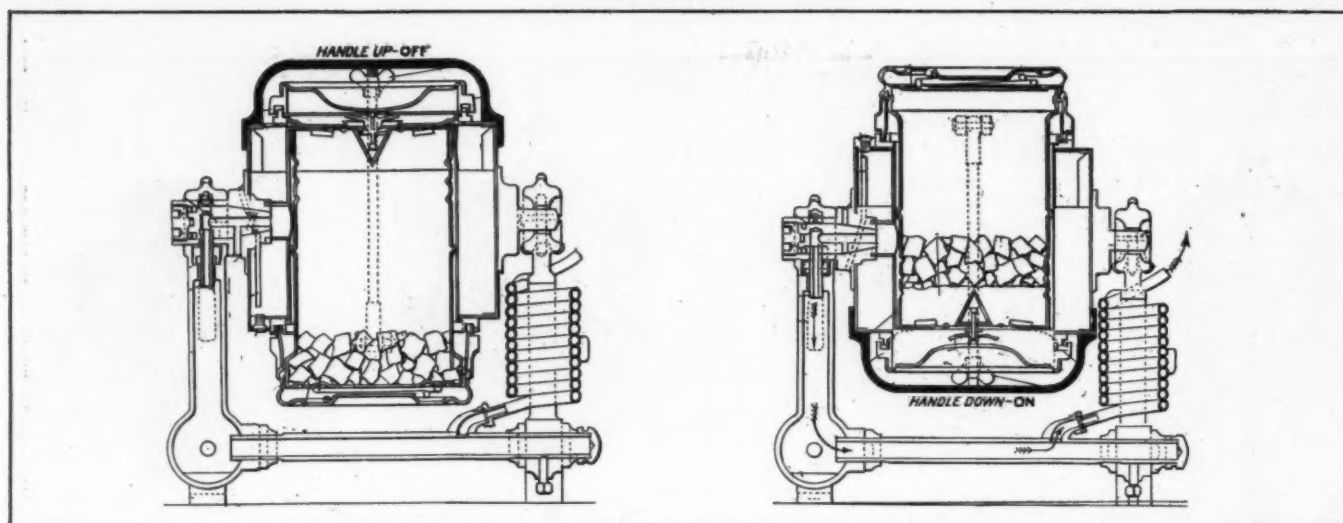


Fig. 6—Sectional views of Neverout invertible safety gas producer, showing on and off positions

the lamp is to attain the highest efficiency and be most suitable for the purposes for which it is required. Besides illuminating the road ahead, the headlight must illuminate the road to either side of it for a short distance. It would be comparatively simple with an ordinary searchlight focus to secure the single straight beam of light for illuminating the road to a great distance ahead of the car, but which would fail in the second particular, so that at close range the driver could see but a comparatively small area of the ground on either side of the road.

Two Systems of Focusing Used

THESE two functions of the headlight are secured in the modern lamp by a double focus which has but recently been perfected. With this the light is thrown in two ways—one a fan-shaped ray which illuminates the ground at a wide angle in front of the car while the other sends the light directly ahead in a long sweep which enables the driver to see the objects in the road for a surprising distance. Besides the device of having the two systems of focusing embodied in a single reflector there is the arrangement of varying the focus of the lights, which has been used to considerable extent. The reflector of the headlight is of parabolic shape. A method of obtaining correct focus in a lamp is to allow the lights of the car to shine on a wall. When the field shows up brightest and both lights strike the same spot at about 40 feet from the wall the focus is correct. If it is desired to spread the rays slightly the method employed is to move the light from the focal point. There are several in-

genious ways of doing this, two of these being shown herewith.

The method used by the Gray & Davis Company is shown in Fig. 7. The focus may be altered and the rays of light changed from a straight line to a fan-shaped area by turning the knurled screw K at the top of the lamp just within the door. When the screw is turned the link L is pulled up or pushed down on

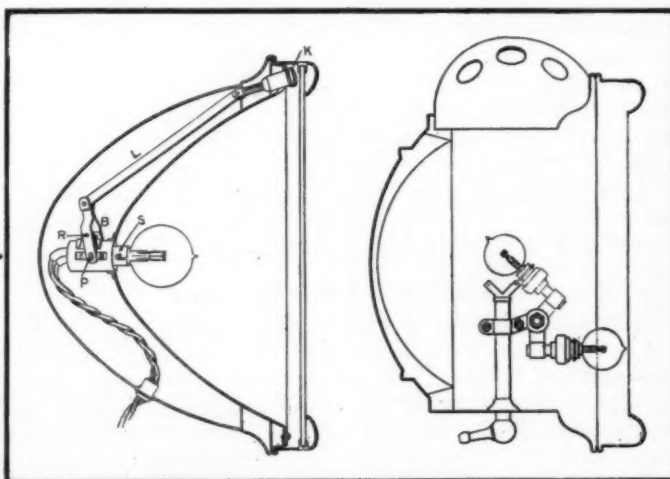


Fig. 7—Gray & Davis electric headlight and electric gas attachment

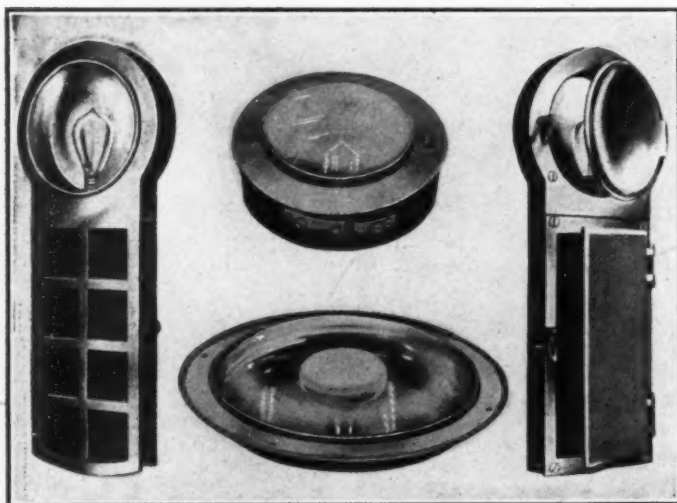


Fig. 8—Cowles dash ventilators with lights (front and back views) and interior dome lights

account of the threaded part at the upper end engaging with the tapped piece which turns in a collar on the frame of the lamp. The link engages with a bell-crank lever B pivoted at the point R. The bell crank lever is swung backward or forward about the pivot as the knurled screw is turned and at the same time the lower end is held on a sliding pivot P which is integral with the lamp socket. In this manner the position of the lamp may be readily altered at the will of the operator in respect to the reflector.

As all the working parts of this device are behind the reflector the functions of this important part of the mechanism are not in the least interfered with. The lamp socket S may be of the popular Ediswan or any other type in this lamp and the device will work just the same. One of the good features of this method of altering the focus is the fact that the wires do not have to be dragged through a small hole every time the focus of the lamp is changed. In the Gray & Davis focusing device there is a sufficient quantity of wire within the lamp housing to take care of any motion back and forth that the lamp may be given.

Another system which has been used with great success by

the Vesta company is illustrated in the sketch shown at Fig. 13. A small cylindrical piece with a flange which runs its entire length is the key to the device. This flange piece is hollow. It is shown at P in the figure. It passes through the boss on the back of the reflector. It is kept from turning by the flange which is on the upper side of it, but is free to move backward and forward. Since the lamp socket is located at one end of the flanged piece and screws into it, it is evident that a forward or backward movement of the part will carry the bulb along with it and hence change the focus of the lamp. The method employed to move this piece backward and forward is also shown in the sketch. The rear end of the flanged piece, the opposite end from that which carries the socket, is drilled and tapped. Through the rear extremity of the body of the lamp there passes a screw which is integral with a winged nut on the back of the lamp body. A collar is located within the lamp so that the screw is merely capable of a rotary motion and cannot move laterally. The screw passes into the tapped end of the flanged piece and engages with the threads in this part. As the wing nut is turned the flanged piece is carried backward or forward according to the direction of motion of the screw. Since the reflector is fixed in relation to the body of the lamp it is evident that there will be a relative motion of the lamp to the reflector and hence a change of focus. The focusing may thus be performed without getting in the way of the lamp.

With all methods of changing focus the objective point is the same; that is, to secure a light which will illuminate the road for

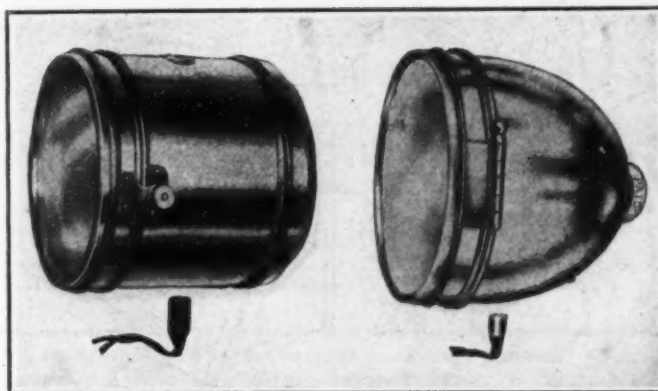


Fig. 9—Two types of Vesta focusing side-dash lights

rays is obtained. There is a certain candlepower of which the lamp is capable and the object is to divide this in the most advantageous way, by directing a certain part of the rays before the vehicle and the remainder to the sides of the road. The main difference between changing the focus of the lamp so that the light is no more at the focal center of the parabola and the double focus lamp is that in the former case there are no rays which leave the lamp on a series of straight parallel lines, while in the latter a part of the rays leave the lamp in this manner while the remainder are thrown to the sides of the vehicle in a cone-shaped ray. When the width of the beam is alone relied upon, as in the Rushmore and others, an excellent division of the rays is obtained.

Combination Lamps Are Useful

COMBINATION lamps have claimed the attention of the lamp makers for some time on account of the diversity of uses to which they may be put, and at the same time they form a handy means of getting home in case the driver of the car should have the misfortune to have his gas or electric system go back on him while driving at night. Most combination lamps are of the oil-electric type and are used for side lamps of touring and other types of bodies. There are, however, combination headlights which are adapted to the use of either acetylene gas or electricity. One of these is shown in Fig. 14. It is known as the Solar gas-electric headlight and its operation may be readily perceived from a glance at the illustration. The electric bulb or the gas burner may be swung into the correct focal position when desired. It is recommended that gas be used for country driving with this lamp and the 6-volt Tungsten lamp be swung into place for city use. Other voltages may be used in connection with these lamps, but that mentioned will probably be of the greatest use on account of its being the general voltage used in connection with ignition system of the motor.

One of the advantages claimed for electric lighting is the great number of artistic shapes which are rendered possible by this form of lighting. It is certain that the past few years

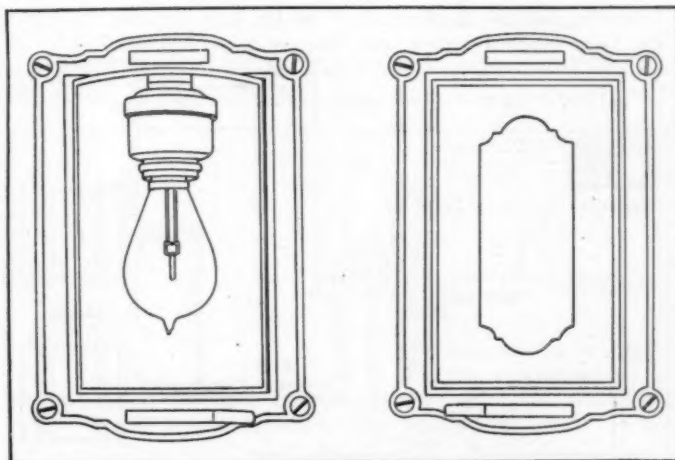


Fig. 10—Cowles disappearing electric corner light in open and closed positions

a sufficient distance ahead of the machine and at the same time render visible the sides of the road at least immediately contiguous to the wheels of the car. With the double focus method there is a slight sacrifice of the light to the front of the vehicle—that is, for distance—but this is never more than would be the case with altering the focus until the same spreading of the

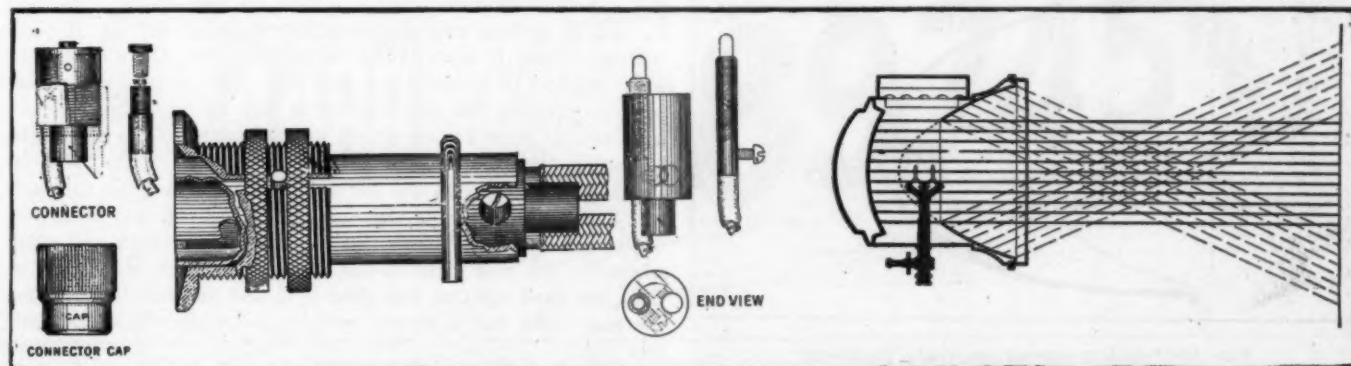


Fig. 11—Solar Ediswan focusing bulb socket. Double forms of light rays on Neverout searchlight

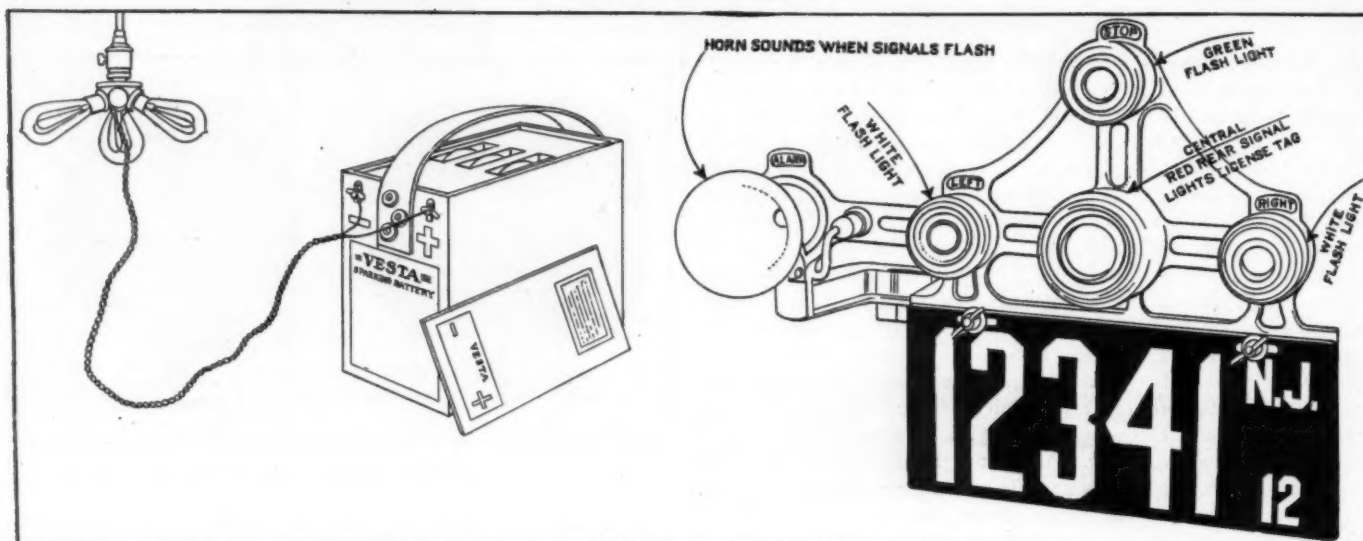


Fig. 12—Vesta lamp-changing outfit. Neverout combination rear-signal bracket and license plate illuminator

have seen wonderful progress in this respect. The finely finished limousine and berline types of bodies require more than the ordinary type of lamp to set off the beautiful design. The electric lamp has come to be looked upon by the bodymaker as an opportunity for the embellishment of the car. The corner lamps, reading lamps and dome-lights which have been brought out show the highest development in the decorative art. A few of the designs are depicted in the illustrations on these pages and show for themselves how the lamp builders have adapted the lamp to the vehicle in which it is fitted in order that the design may blend harmoniously with the luxurious upholstery found in these types of bodies. The disappearing corner lights are a novelty which add greatly to the attractive appearance of the limousine. In the daytime when the lights are not required the cover, which may be seen in the illustration, Fig. 10, is turned over the light. This shuts off the light and at the same time conceals the bulb. The bulb is in this manner protected from breakage and the cover gives a very neat appearance

which increases the attractiveness of the interior of the car, being of metal and artistically designed.

The subject of dash illumination is of interest. A very neat idea which has been brought out by the Cowles company is the dash ventilator with lights. These are designed to do away with the side oil lights. They are fitted on the dash and are integrally constructed with the dash ventilating device. A very powerful reflector is placed back of the bulb in order to throw the light forward in the same manner as would be done by an oil side lamp of large size. One of the features of this device is that the gauges or other dash attachments may be seen easily

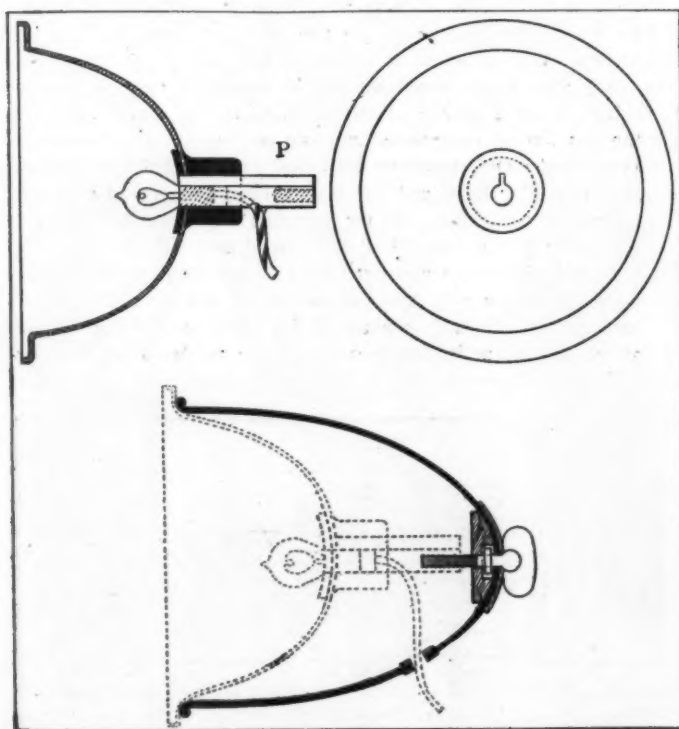
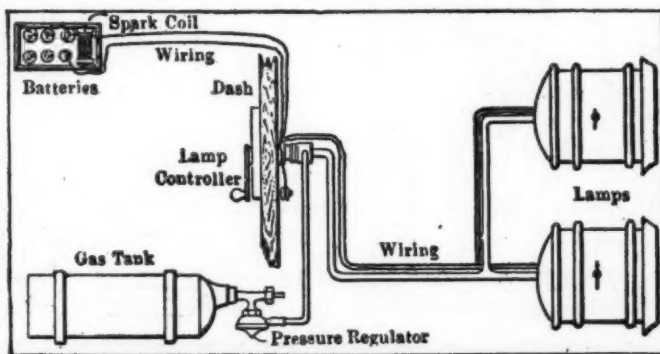


Fig. 13—Focusing device on Vesta headlight



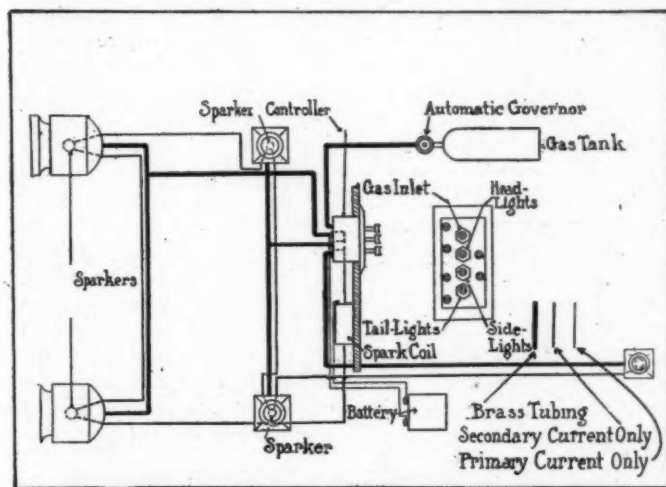
Scheme of the P. & B. motor-light lighting system

on the darkest night by opening the door of the lamp. This causes the dash to be illuminated and at the same time does not interfere, when the light is not required, by projecting from the dashboard to such a distance that it is in danger of being knocked from its correct position.

Illuminating Dash Instruments

It is a great mistake to keep a light burning on the dash of a car, as anyone who has done any extended driving at night will be willing to state; still at the same time there should be some method of illuminating the dash when it becomes necessary to examine the speedometer or any of the other registering devices. One of the newest developments of the dash light is used at the same time as a pilot for the tail light. That is, should the tail light go out for any reason the lamp on the dash will light up. It may be that the bulb in the rear has burnt out or become broken. At any rate the light on the dash will shine whenever the rear light is not operating. If it is desired to light the dash light at any time it is not necessary to cut out the rear light, but a simple push on a button will accomplish this end.

The subject of rear lamps is also of great interest and there are many new combination tail lights and license plate illuminators. Included in many of these is a signaling device for calling the attention of the driver of a car behind to the fact that the operator is about to turn to the left or right or that he is going to stop. In one of these ingenious devices, the Neverout, Fig. 12, a horn is blown at the rear coincidentally with the lighting of the signal lamp, so that the following driver's attention is sure to be called to the signal. The arm of the driver in the car ahead cannot be seen at night, and a method of signifying to the following driver that the car ahead is about to slow down in order to make a turn should prove very popular, and in fact has already done so. Where the tail light is merely used as a license plate illuminator it is common practice, as is shown in such examples as the Neverout and Burgess types, Fig. 15, to make the license holder integral with the lamp. The two types mentioned above represent the two general methods of approaching the problem. In the Neverout lamp shown at the left side of Fig. 15, the bracket which holds the license tag is securely fixed to the lamp so that the relative positions of the two cannot change after the license plate has once been fixed in the correct position. The whole outfit is designed to fit on any tail lamp bracket. The Burgess lamp is a combined license number illuminator and tail lamp. Metal numbers are mounted on a white celluloid semi-transparent card. This is also shown in Fig. 15, from which the construction may be readily under-



Start-Lite acetylene illuminating system

stood. The electric Neverout rear system, Fig. 12, is very complete. It is in this device that the horn sounds when the signals for right or left-hand turning are given. The white lights flash the signals while a green light signals the following

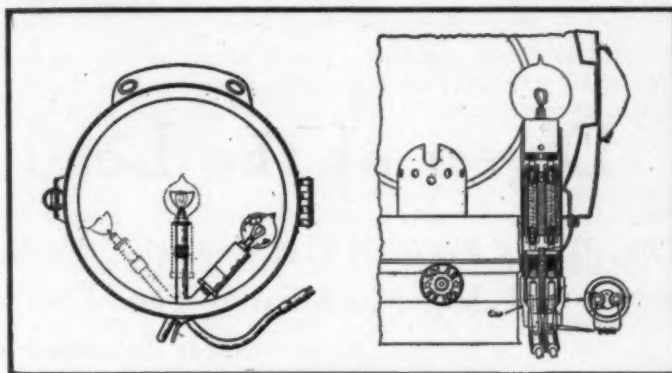


Fig. 14—Solar gas-electric headlight and part sectional view of combination electric-oil lamp

driver to stop. The central light, which is red, shows constantly and illuminates the number plate. The entire device is operated by a series of buttons on the dash. The Rex device is very ingenious in its construction, the signals given being by means of large red arrows which point to the right or left according as the driver is turning in either direction.

Lamp Filaments Are Improved

VARIOUS improvements in filament construction may be noted in this year's product and a few of the many types are shown in the illustrations. The Mazda deserves special attention and is shown in Fig. 3. The efficiency of these lamps is very high and the resulting light very white. In summing the lamp situation up it may be said that on every hand progress in the line of simplicity and efficiency has been made. The combination of lighting and starting systems has met with favor and during the coming year developments may be looked for along this line. These are of both the electric and acetylene type. The systems whereby a certain amount of the acetylene is injected into the cylinders of the motor and then ignited are very popular. Such tanks as the Prest-O-Lite may be used to great advantage in these systems and the extra piping required is relatively small. The electric self-starting and lighting systems are also just as popular and many cars are fitted regularly with them. Every conceivable idea is being tried out in the self-starter field, the main endeavor being to reduce the number of parts to a minimum. For this reason any system which can be made to operate successfully and at the same time has been used as a source of the lighting supply will be welcomed with delight by both public and dealers.

The principal requirement of a system such as this will be that it must not fail when the motor is cold on account of the fact that the car has not been used for some time. Above all, it must not interfere with the operation of the lighting system.



Fig. 15—Neverout-Pennsylvania tail light. Electric Appliance Company's Burgess tail lamp

Digest of the Leading Foreign Journals

Details of a Practical Gas Explosion Turbine Engine—Certain Gases Pass Through Rubber Much Faster Than Does Air—Faults in Spring Suspension Most Numerous, Brakes Next

THE Latest Gas Turbine—In spite of all previous failures in producing a practical gas explosion turbine engine—failures which arise mainly from the intrinsic difficulties in obtaining a suitable compression of the explosive mixture as well as an efficient application of whatever working pressure is produced by its explosion—inventors continue to devote time and money to the development of this type of engine, and eventually someone will succeed.

An engine recently built by F. J. E. Johansson in Stockholm, represents a considerable improvement over other designs. A number of explosion chambers are arranged in sequence, each provided with inlet and outlet valve and spark-plug, and the opening of the outlet valve in one chamber opens the inlet valve in the chamber next in the order of explosions. The explosion chambers are stationary, and the exploded gas is led from each chamber to a turbine wheel where the expansion takes effect in the usual manner.

In the accompanying illustrations details are omitted where they would interfere with clearness. Fig. 1 gives an edge view partly in section with only two of the explosion chambers shown. Fig. 2 gives a side view of a portion of the engine.

The explosion chambers *b*, *b*₁, *b*₂, etc., are arranged around the turbine housing *a*, and each has an inlet valve *c* and an outlet valve *c*₁, a spark-plug *d*. The valves are closed by springs *e*, *e*₁, all valves *c* opening inwardly and all the outlet valves *e*₁, opening outwardly. The valve stems *f*, *f*₁ project from the valve housing *g*, *g*₁. From the free end of valve stem *f*₁ of each explosion chamber a two-arm lever *h* extends to the free end of the valve stem *f* in the next explosion chamber, to the effect that when the outlet valve *c*₁ is pushed out under the influence of the explosion, this lever *h* is turned and opens the inlet valve *c* in the following explosion chamber, thereby causing it to be filled with explosive mixture from a tank, not shown, which contains air or mixture under pressure

and discharges into the tube *k*, connecting all the inlet valve housings, *g*, *g*₁, *g*₂, etc. The carburation may be taken care of either in the charging or the discharging of the tank, through a carbureter or equivalent device.

Each lever *h* forms, in conjunction with a suitable contact *i* opposite to the end of each valve stem *f*, a switch in the circuit for the corresponding spark-plug *d*, to the effect that the circuit is closed—save for the spark gap—when the valve *c* returns to, or near, its position of closure.

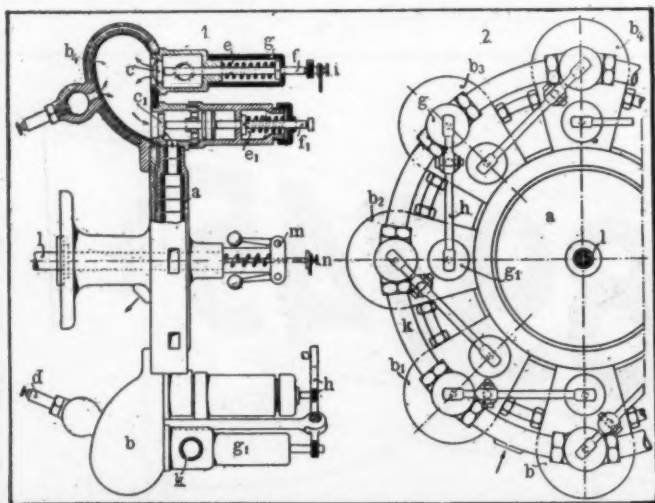
Upon the turbine shaft *l*, or on a shaft driven from it, there is in addition a centrifugal governor which forms a master switch for interrupting the ignition current for all explosion chambers, when the speed of the engine reaches a desired maximum. There is also in the circuit of the spark-plugs another master switch, not shown, which can be thrown in by hand to close the circuit when the engine is to be started.

To start the engine, mixture is first let into tubular conduit *k* from the compression tank and the inlet valve *c* of one of the explosion chambers, for example *b*, is opened by hand. Then this charge is fired by closing the hand switch for the whole circuit, and the explosion opens outlet valve *g*₁, the gases passing from valve chamber *g*₁, through a valve to the turbine wheel, while at the same time, as described, lever *h* opens the inlet valve of explosion chamber *b*₁. As soon as the gas pressure in explosion chamber *b* has dropped to the point where the spring of the outlet valve *c*₁ is strong enough to close this valve, the inlet valve of *b*₁ goes back to its closed position and the lever *h* acts as a switch by contact with *i*, exploding the charge in *b*₁; and so on.

In this manner the chambers are fired successively, but the engine may also be worked with two, or even three, chambers firing at the same time. This is done by starting, for example, *b* and *b*₂ at the same time by filling them both by hand and then closing the hand switch, whereafter *b*₁ and *b*₃ will be fired next by the lever action. The question of how much may be done in this manner to increase the power capacity of the engine evidently depends upon the facilities for taking care of the heat development and the lubrication. It is also evident that the relation of the chambers and valves to the turbine wheel need not be one of concentric arrangement. The design is susceptible of considerable modification.—From *Der Praktische Maschinen-Konstrukteur*, February 1.

Every Tire a Nitrogen Factory

CARBONIC acid gas, CO2, does not pass through porous porcelain or parchment as rapidly as air does. Indeed, the various gases pass through porous substances at speeds which, according to the experiments of Graham, are inversely proportionate to the square of their density numbers. Hydrogen, for example, passes through very rapidly. But a thin membrane of rubber is not a porous substance in this sense. The French tire manufacturers, Michelin Brothers, have looked up the subject in order to make sure whether or not it would be advisable to fill tires with carbonic acid gas or any other gas rather than with atmospheric air, and they supplemented their research with experiments of their own. It was found that all the scientists agree. Graham himself



Gasoline turbine engine built by Johansson of Stockholm.—Fig. 1—Edge view, partly in section and with all but two explosion chambers omitted. Fig. 2—Face view of a portion of the engine, some parts omitted

found that his law did not hold good for a membrane of rubber. Carbonic acid gas passed through it from six to twenty times as fast as air, the variation depending upon variation of the temperature at which the experiment was conducted. Mitchell at about the same time, in 1866, Wroblevski in 1876 and Stephan in 1878 confirmed his results. The carbonic acid does not go through rubber in gas form at all, but is transformed into a liquid while passing through and is gasified again on the other side. In a pamphlet published at Dresden in 1907 by A. Slingero and Ramondt, this phenomenon is explained by citing Payen, who found that a rubber membrane is full of microscopic pores which dilate under the action of liquid, but not under the influence of gas as such. Leroux had made a similar observation. Aronstein and Sirks find with Graham that carbonic acid gas escapes through a confining rubber membrane faster and nitrogen slower than any other gas, and that in all cases the escape increases with the temperature. In "The Chemistry of India Rubber," by Carl Otto Weber, this specialist gives exact figures on the same subject. The relative rates at which the different gases pass through a rubber membrane are given as follows:

Air	1.149
Oxygen	2.556
Hydrogen	5.500
Carbonic acid	3.585

The experiments of the Michelins showed that nitrogen has a still much slower coefficient of diffusion than air, and that the figures apply approximately to all such degrees of compression to which the gases may be subjected in pneumatic tires. In reality, however, when a tire is inflated with air it will before long be found to be full of almost pure nitrogen. By reason of passing all other gases out before it will let go of the nitrogen, the pneumatic tire becomes in itself a miniature nitrogen factory. The air introduced in the tire at the first inflation is a mechanical mixture of about 80 parts of nitrogen and 19 parts of oxygen, the remaining 1 per cent. being made up mainly of argon and carbon dioxide. After the first inflation, when the pressure goes down after a while, it is mainly the oxygen which has escaped. The second inflation introduces again 4 parts of nitrogen and 1 part of oxygen, and again the oxygen escapes first. After one more such operation there is little left but nitrogen in the tire, and thereafter, unless the tire has a definite leak, it will hold its pressure for a very long time.

This is a result which it is impossible to obtain with carbonic acid gas, and it also suggests the advisability of not permitting any of the old and valuable nitrogen content of a tire to escape at the valve when additional inflation becomes necessary.

To get down to absolute practice the Michelins filled some air tubes with air at 3 kilograms pressure per square centimeter and other tubes with carbonic acid gas at the same pressure, kept both sets at a constant temperature for 72 hours and again measured the pressure to see how much of the content had escaped. The result is shown in the accompanying tables.

AT A TEMPERATURE OF 18 TO 20 C.

Thickness of rubber in tube	Final pressure of air	Final pressure of carbonic acid
1 mm.	2.75 kilograms	0.60 kilograms
2 mm.	2.90 kilograms	0.85 kilograms
3 mm.	2.95 kilograms	0.05 kilograms

AT A TEMPERATURE OF 35 TO 39 C.

Thickness of rubber in tube	Final pressure of air	Final pressure of carbonic acid
1 mm.	1.60 kilograms	none
2 mm.	2.20 kilograms	0.10 kilograms
3 mm.	2.40 kilograms	0.15 to 0.20 kg.

Some additional experiments showed that at wintry temperatures, such as 5 to 10 degrees C., the carbonic acid gas did not escape faster than air does at 18 to 20 degrees, and that the law proclaimed by the scientists was perhaps somewhat modified if tubes of very thick rubber were used. But otherwise, for ordinary temperatures and for tubes of ordinary thickness, it was evident that carbonic acid gas was not a

practicable medium with which to inflate pneumatic tires. It was found, on the other hand, that the gas does not injure the rubber nor change its composition. It simply goes through it like water through a filter.

After this documentary evidence from the Michelins and the world of science, there comes now, however, the commercial statement from another side that certain inner tubes—in which presumably the nature of the rubber must have been changed in some respect—do hold carbon acid gas just as securely as they hold air. Is this information correct? We do not know. The burden of proof seems to rest on the makers of these tubes.—From *Omnia-Locomotion*, February 3.

Immediately in the following issue of *Omnia-Locomotion* the manufacturers of "Sparklets" tubes, which contain in a very compact form carbonic acid gas expressly intended for the convenient inflation of tires, make the offer to all who may believe that carbonic acid gas escapes more rapidly from a tire than atmospheric air that they come and have their tires filled at the company's offices in Paris, Lyon or Bordeaux and then observe for themselves whether the scientists and Michelin are right or wrong. An experience of 2 years has demonstrated, the company states, that air, nitrogen and carbonic acid gas all escape from a tire at about the same rate.

[Assuming that all the contentions in the case are technically correct there seems to be only one possibility which might reconcile them; namely this, that a rubber membrane ceases to act as a sieve for carbonic acid gas when it is pressed against a confining wall such as the inner lining of the tire casing.—Ed.]

A Straw Vote on Shortcomings

RECENTLY *La Vie Automobile* sent out printed blanks to owners of automobiles, requesting them to specify whatever complaints their experience dictated with regard to their vehicles, and more than 6,000 answers, relating to 110 different makes of vehicles and to a still larger number of models, were received. Many American cars were among the number; also many English ones; but the bulk of them were, of course, French. The whole mass of information is referred to as a popular referendum, the findings of which should be of value to the manufacturers in all those cases where a large number of users of a car agree in pointing out the same fault or faults. After classifying complaints according to their subjects, the journal finds it possible to make some general deductions without stepping on the toes of any one among the manufacturers, and these are given in the following:

The principal fault of the automobile in 1912 is still an unsatisfactory spring suspension. Few vehicles escape blame for being poorly suspended, poorly centered or for not "holding the road" well. In the case of some makes there is noted a retrogression as compared with earlier models of the same. The Americans have made special efforts to improve the suspension, no doubt due to the need of making speed over their poor roads. The extraordinary vogue of shock-absorbers and auxiliary coiled springs shows that the suspension problem engages the attention of many, while it has not yet been definitely solved.

The brakes constitute another weak point in a large number of vehicles. The complaints speak of "insufficient brakes," of "brakes difficult to adjust," of "brutal brakes" and of brakes which "get hot." And yet, an almost perfect solution of the brake problem exists," adds the editor of *La Vie*, after noting that more than 800 vehicle owners complain bitterly of this feature in the construction, many of them referring to cars of celebrated makes. About one out of eight correspondents find fault with the brakes and it stands to reason, the editor says, that many more have accustomed themselves to faulty brake action and do not know how much the brake action might be improved.

Very many of them demand that the vehicles shall be sold complete, as in the United States, with the carriage work fitted to the chassis and the accessories selected and in place—the car ready to travel when the purchaser receives it—From *La Vie Automobile*, February 17.

Letters Answered and Discussed

Keeping Rims from Rusting; Quick Repair of Leak in Gasoline Line; Preventing Deterioration in Mohair Tops; Stopping Slip in Oldham Coupling

Paint Prevents Rust on Rims

EDITOR THE AUTOMOBILE:

[3,046]—As a subscriber to THE AUTOMOBILE I would be pleased if you would answer the following question:

As I do not use my car during the winter months, I removed the tires and found that several of the rims were very rusty. I would like to know what kind of paint is best and the best way to apply same so that this will not occur again.

Lyon Station, Pa.

MILTON SAUERMILCH.

An application of graphite after you have removed the rust which is now on the rims would keep off the rust. A very good scheme is to apply a couple of coats of floor-paint, such as is used on hardwood floors. Japalac would do this very well. Apply with ordinary flat brush.

Adjusting a Model F Schebler

EDITOR THE AUTOMOBILE:

[3,047]—I am a subscriber to THE AUTOMOBILE and would like to know how to adjust the model F Schebler carbureter. I have a car which runs all right if I travel at from 15 to 20 miles per hour. I cannot get it to run slow on high gear without missing fire. Otherwise the car is all right.

Orion, Mich.

ROBERT MCLIFFE.

Retard spark as far as possible and throttle down. Then turn down the needle valve until the motor runs satisfactorily at low speed. Speed the motor up and advance the spark. If you do not get enough gas, turn the needle on the dial from 1 toward 3 until the motor runs right at high speed. Then try the low speed again. Alternate with low and high speeds until you have determined the point at which the best results are obtained on both high and low speeds.

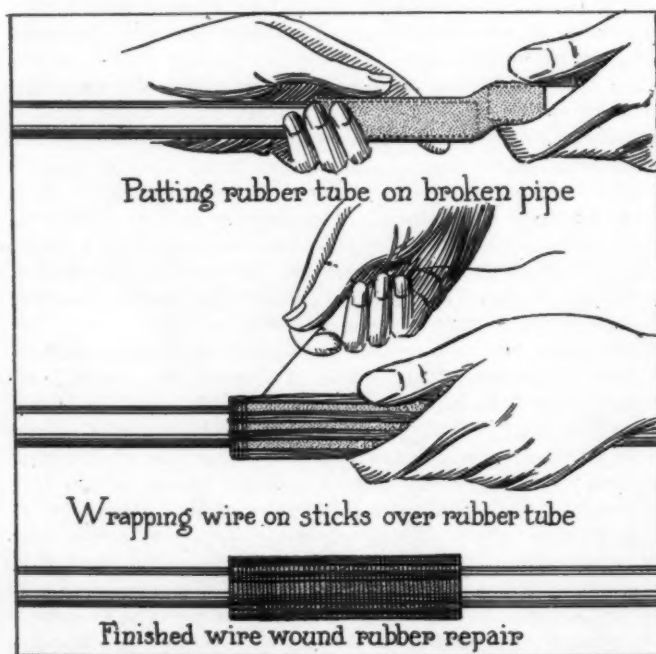


Fig. 1—Showing the processes in a quick repair of a broken gasoline pipe

Stopped Leak Near Carbureter

EDITOR THE AUTOMOBILE:

[3,048]—Perhaps the following may be of interest to some of the readers of THE AUTOMOBILE:

While ascending a steep grade several miles from town, my motor stopped suddenly. On raising the hood I found the gasoline supply pipe leading from the tank to the carbureter had broken a few inches from the latter. The gasoline was pouring out at a rate that would have soon left us stranded. First I shut off the flow of gasoline by turning the pet cock under the tank. My next move was to join the ends of the broken pipe by slipping a piece of rubber gas tubing over the broken spots, Fig. 1. Then, in order to protect the tubing, I put little wood splints around it and bound them securely with wire. This enabled us to reach a garage without further trouble.

Humphries, Mo.

M. C. MOBERLY.

[Have any other readers of THE AUTOMOBILE tried anything along this line for a punctured radiator? It takes quick action when a leak is discovered in order to avert being stranded, and the experiences of those who have happily met these difficulties form a useful adjunct to the information which should be possessed by the driver who traverses all sorts of country.—Ed.]

Keeping Mohair in Condition

EDITOR THE AUTOMOBILE:

[3,049]—I have noticed that there is an accumulation of dust in the folds of the mohair top of my car which seems to be damaging the fabric. I would like to keep the top in good shape as the material is of the best and as a consequence the price was rather high when I bought it. There are many things which I have been advised to use but I am somewhat suspicious that some of the advice I have received is not altogether good so I am turning to you for advice in the hope that you will publish in the answers department of THE AUTOMOBILE a recipe for some preparation which I may use.

I would also like to know if you would tell me how to go about remedying a worn Oldham coupling. The magneto and pump shaft on my car are separated by means of an Oldham coupling, the faces of which have become so worn that the two shafts are not in their correct relative positions at all times.

Newark, N. J.

I. G. NATZ.

The recipe which is the best for keeping the mohair top in shape is soap and water occasionally applied, with a little sunlight for drying purposes. A stiff brush, with which the soap and water is applied, will keep the top in perfect condition.

If you coat the driving faces of the Oldham coupling with solder, the bad effects of the wear will disappear. Remember the all-important rule in tinning or soldering when doing this. That is, to thoroughly clean the metal to be soldered so that it is bright.

Trouble with Two-Cycle Motor

EDITOR THE AUTOMOBILE:

[3,050]—We have a two-cylinder, two-cycle motor with a 3-inch bore and 3 1-2-inch stroke. It has been giving us trouble for some time. We have rebored the cylinders and placed new pistons in them and have re-babbitted the bearings without any effect. It does not work on a 1 1-4-inch carbureter. The motor is made with the exhaust port on the extreme end of the down-

ward stroke and the intake port on the opposite side of the cylinder in the manner common to most two-cycle motors. We have placed the pistons so that they will open the exhaust ports first, 3-8 inch before the opening of the intake. There seems to be an excessive backfiring into the carburetor and also a lack of power. The motor does not start well on priming.

We would like some information on the opening and closing of the ports of such a motor and also as to what carburetor to use. There may be some fault in the ignition. Could you give us some system which could be satisfactorily used on a motor of this kind?

Auburn, N. Y.

E. J. NOLAN.

In the first place, your carburetor is too large. Use a 3-4-inch one and you will be better off. The exhaust should open 60 degrees on the crank circle before bottom dead center and the inlet should open 10 degrees later. See page 665 for method of laying this out in inches of piston travel. Any good high-tension system would give satisfactory ignition.

Differences in Spark-Plugs

Editor THE AUTOMOBILE:

[3,051]—Will you kindly inform me regarding the different kinds of spark-plugs, for instance, the 1-2-inch, the A. L. A. M., the Metric and the Regular? Is the A. L. A. M. plug used by all cars belonging to the A. L. A. M.; Which plug is most generally in use, the A. L. A. M., Metric or Regular?

Endicott, N. Y.

I. E. HOUSE.

The 1-2-inch spark-plug employs the regular 1-2-inch gas-pipe thread, which is a taper thread. The old A. L. A. M. is a 7-8-inch straight thread with a gasket top. There is a 1-16 inch allowance for the gasket at the top of the plug above the thread. The metric thread, which is used to a large extent in foreign cars, is 18 millimeters in diameter and has a pitch of 1.5 millimeters. There is no such thing as the Regular plug; what you refer to is probably the S. A. E. standard, which is fast being adopted by automobile manufacturers throughout the country. The A. L. A. M. has now

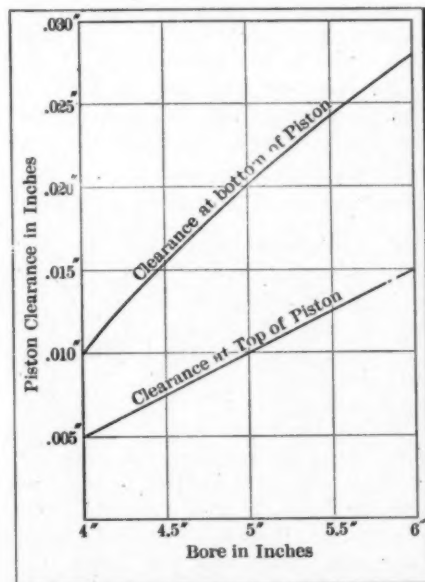


Fig. 2—Diagram showing proper clearance between piston and cylinder

passed out of existence and the 7-8-inch straight thread plug has been adopted as the S. A. E. standard. The plugs now in most general use in this country are the 1-2-inch gas-pipe and the S. A. E. standard, but the latter is being gradually adopted as the preferred type.

Thinks Piston May Be Loose

Editor THE AUTOMOBILE:

[3,052]—As a constant reader of THE AUTOMOBILE I would like to ask some information. How much smaller than the cylinder should the piston be on a gasoline motor and how much spring should the rings have on the pistons?

I have a four-cylinder car and the two front cylinders seem to get too much oil. The car has had this fault ever since I received it, and I think the pistons are too loose.

Sunbury, Pa.

H. S. W.

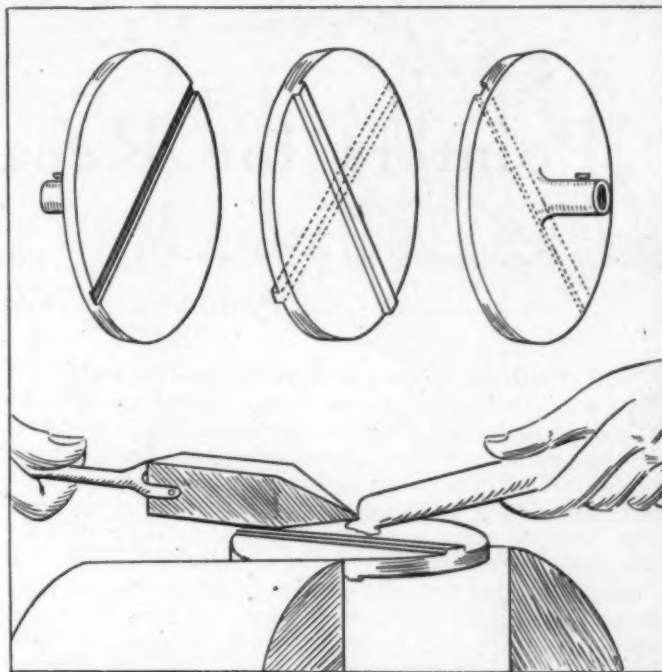


Fig. 3—Method of preventing rattling of worn Oldham coupling

The accompanying diagram will show the proper clearance between the piston and the walls of the cylinder when they are cold. The diameter of the piston ring is 1-4 inch larger than the diameter of the cylinder before it is sprung into place. If the piston rings are tight it would be well to use one of the remedies suggested for an excessive supply of oil on page 613 of the issue of February 29.

Slipping of Oldham Coupling

Editor THE AUTOMOBILE:

[3,053]—The Oldham coupling on the magneto shaft of my car has become so worn that it rattles and throws the magneto shaft out of time. Will you kindly direct me as to how to go about fixing it?

Tallahassee, Fla.

ROBERT MURRAY.

The coupling should be disassembled, as shown in Fig. 3, and the faces coated with solder. Soft solder will be as good a kind to use as any. After the driving faces have been tinned the coupling may be reassembled and it will be found that the slipping will cease and that this repair will last for some time.

Motor Makes Whistling Sound

Editor THE AUTOMOBILE:

[3,054]—There is a hissing noise in my motor which rises almost to a whistle when I travel at high speeds. My motor is exceptionally quiet as a rule but this noise has developed lately. Some friends of mine who have automobiles have told me that the trouble was probably that I did not give the cylinders enough oil, but I doubt this very much as the noise seems to be on the outside of the motor. Would you kindly tell me the cause of this, if possible? I realize the information I have given you is rather scant but it as much as I have been able to find out myself.

Rochester, N. Y.

MORLEY TUBBINS.

The cause of this is very evidently a leaky manifold. As long as the wheezing sound is not accompanied by backfiring and a loss of power, the leak is probably in the exhaust manifold. First examine the gaskets to see if there is a leak there. Pour a little oil on the gasket while the motor is running and note if there is a formation of bubbles due to the leak. If this is not so a search should be made for a blowhole.

Pointers for Repairmen and Drivers

Motor Scavenging in the Two-Cycle Type—How to Insure Effective Service from the Automobile's Water Circulation System

SCAVENGING of the Two-Cycle Motor—The problem of scavenging the motor seems to have been relegated to the rear of late and the matter allowed to rest as it stands. Once in a while a scheme of great originality but doubtful merit will be produced with the claim that the scavenging problem of the two-cycle motor has at last become a matter of the past. This gives rise to the query as to what is the real cause for the difficulty found in removing the dead gases from the cylinder. It is not the fact that they have not time to get out, for the high gas speeds necessary to the intake where the gases are under very small pressure have not been found to be of any real difficulty in the way of successful operation. The real difficulty is the pockets which are apt to be created in the type of combustion chamber which is necessary for the two-cycle motor.

When the exhaust port is uncovered on the downward stroke the gases rush through the opening at a very high velocity which creates a decided injector effect on the gases which follow those first discharged. The resulting drop of pressure is so great that, in the short interval which occurs between the opening of the exhaust port and the opening of the intake, the pressure in the combustion chamber has dropped very close to atmospheric. For this reason the gas which has been previously compressed in the crankcase of the motor flows in and helps to scavenge the motor by pushing out ahead of it the dead gases which remain in the cylinder. In order that the gases which are flowing into the cylinder will not pass directly through the exhaust port, there is a baffle-plate placed on top of the piston, which deflects the gases upwards. These details are shown in the accompanying illustrations depicting the course of the gases. It is very evident from the illustrations that there will be a pocket in the top of the cylinder, about the intake port, which will be found to present the greatest difficulty to perfect scavenging and it is to this end that the designers have turned their attention with varying success.

It is interesting to study the amount of lead given the exhaust over the intake in order that the pressure in the cylinder should fall sufficiently at the time of exhaust so that there will be no resistance to the incoming gases. This lead will often represent several degrees, about 10 in most cases, on the crank circle, while if this same amount is measured along the stroke of the

motor it is very small indeed so far as actual piston travel is concerned. This can be very well illustrated by the diagram which is shown in Fig. 1. A circle is drawn to scale representing the travel of the crank-arm. The connecting-rod is then drawn in for the positions of inlet and exhaust opening and closing.

In order to obtain the best scavenging effect the gases must have a clear flow through the exhaust port. The pressure in the cylinder must drop quickly and, above all, the timing must be correct. This latter feature has been changed to a considerable extent of late years, especially as far as exhaust opening is concerned. The maximum is now about 71 degrees on the crank circle from bottom dead center as against 60 degrees a few years ago. The present average practice for motors designed to run at a speed of about 1,800 revolutions per minute is about 60 degrees from dead center, the inlet opening from 10 to 12 degrees after the exhaust opens and closes and the same distance before the exhaust closes as the piston is on its upstroke. Since the exhaust does not close until after the inlet, an additional scavenging effect is produced at this part of the cycle, while only an inappreciable amount, if any, of the new gas is lost through the exhaust port.

WATCH the Water Circulation—Leakage in the joints of the circulation system, loss of water through boiling, and evaporation must be eliminated to the greatest possible extent. There is only one method of detecting the bad spots and that is by rigid inspection. When the joints are leaky they will be readily found by the water which works its way through, leaving a rusty-looking mark near the weak point. If the leaks are large they will, of course, be shown by the dripping of the water through the weak spots but the owner of the car should not wait until the leak becomes as bad as this before repairing the joint. If it is a flanged joint, this is done by carefully removing all signs of the old gasket after having taken out the bolts which hold the flanges together. This is accomplished by means of a hammer and chisel. When this is done the flanges of the pipe should be filed until they are bright and smooth. It is then ready for the new gasket.

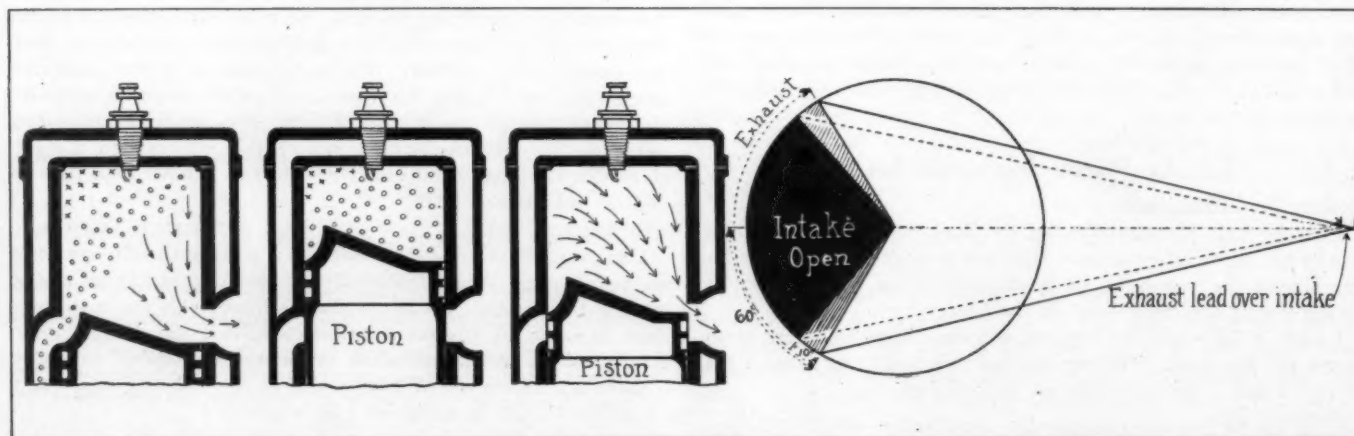


Fig. 1—Intake, compression and exhaust two-cycle motor. Diagram showing port openings

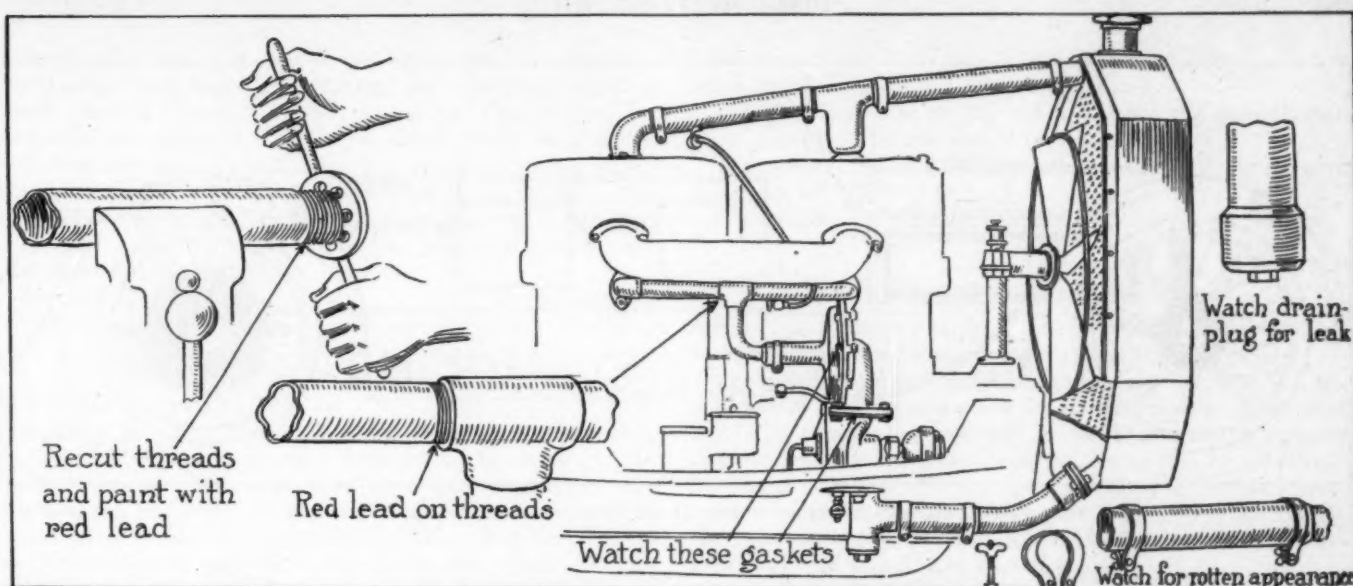


Fig. 2—Points to note in keeping the automobile's water-cooling system in proper condition

Gasket materials for water pipes are sold by any hardware concern. They come in sheets of varying sizes. A sheet of this gasket material is laid over the pipe and then tapped with a hammer so that the imprint of the desired shape will be left upon it. The gasket is then cut, put into place and the nuts tightened. One precaution to be observed in fitting any gasket is not to allow any portion of the material to be squeezed into the piping when tightening the nut. This may be readily avoided by cutting the hole in the gasket a little larger than the hole in the piping.

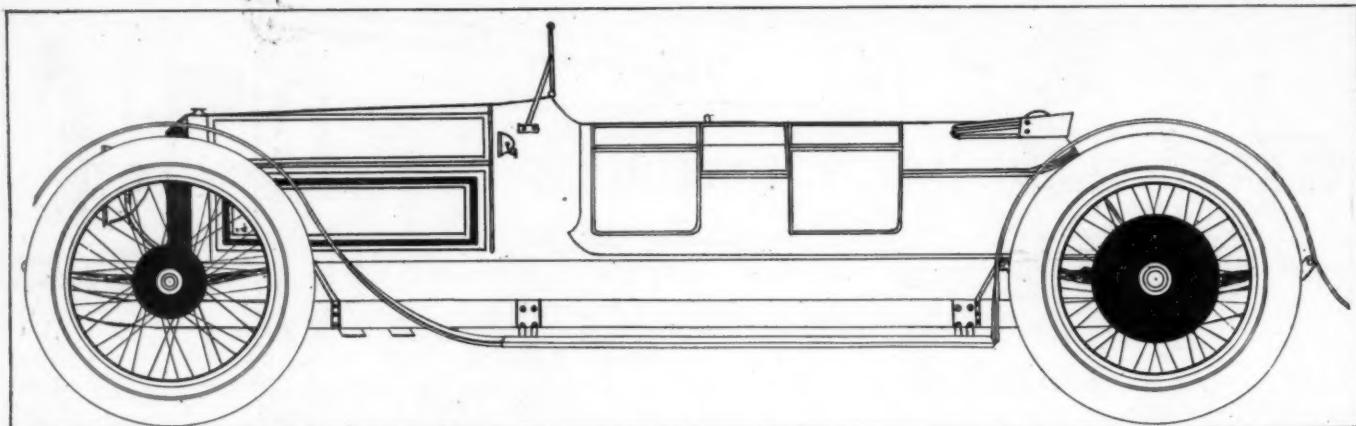
If the joint is of the ordinary union type, the leak will be easily checked by tightening the nut about a half-turn. A handy thing to remember is that a little red lead applied to screw threads will generally make them very tight fitting. The water tubing of an automobile undergoes severe strains due to the rapid vibration and, for this reason, it cannot be examined but once in a year or two like the plumbing of a house, but it must be watched from day to day. The hose and its connections are often a source of weakness. When the hose is worn it will become ragged-looking on the outside. The rubber which surrounds the fabric will commence to have a torn appearance and the water will seep through the fabric. There are two ways of remedying this; one is renew the hose and the other is to repair the old hose. The first is the better and more permanent repair. In doing this a piece of hose of the same thickness and length as that now in place is secured. The clamps which hold the hose in place are removed. The new hose is slipped in place and the clamps put over it and screwed up tightly, if they are of such a type that they are secured by a small bolt. If not, the operator will do very well to buy two of these from a repair shop. The cost will be small and they are easily removed, being far better for this work than wire or any similar contrivance.

LEAKS in the radiator are often hard to reach. They are detected by the steam arising from the water that flows through the leak and down the outside of the radiator. The great facility with which the cooling water will boil after the radiator has been refilled is another clue which, although it is common to all leaks in the system, will lead the operator to the point at which it occurs. It is hard at times to detect the exact spot at which a leak occurs in a radiator. When this is the case take the radiator off and after plugging all but one of the openings, run the tube of a tire pump through a cork and then place the cork in this last opening. Place the radiator in a tub of water and then pump air into it. Bubbles will issue from the points of leakage. This should be immediately marked so that it can be

found again after the radiator is removed from the water. A little solder is then secured and the leak repaired. When soldering remember that the metal must be scrupulously clean before the flux is applied or else the solder will not hold.

Boiling is a cause of loss. Water boils at 212 degrees Fahrenheit at atmospheric pressure. For this reason the cooling system of an automobile is so designed that the water is at the temperature of about 180 degrees under average running conditions. This leaves a margin of 32 degrees before the boiling point is reached. When climbing a hill with a retarded spark the motor naturally becomes warmer and for this reason the margin is left although as a matter of fact the engine would be run at a higher efficiency if the temperature of the cooling water could run higher. Space does not permit of going into details of this matter here, the most important feature being to see that the water does not boil and escape from the radiator.

SCALE in a Radiator Hurts Its Efficiency—The formation of scale in a radiator impairs its cooling powers as the scale is an exceedingly poor conductor of heat. As a result of this the heat is not transmitted to the metal of the radiator and hence cannot be thrown out to the air. The formation of scale can be prevented from accumulating to such a point where it becomes very detrimental to the cooling system by regular attention. Every month a pail of boiling water with a handful of soda should be poured into the radiator and the car started and allowed to run for about a minute. This should then be drained out and fresh water put in. After the fresh water has been run through the motor for a minute or two, it would be well to allow this to drain out also and then to place a fresh supply of water in the system. If the cooling system seems to be very dirty as far as scale goes, it would be very wise to run the soda solution through it several times in order that all of the scale will be taken out. Hard water should be avoided. It is very hard to tell whether water is hard or soft, but the following may be used with success: Take a quantity of water in the hands and go through the motion of washing. If it is difficult to rub the hands together the water is hard. Ordinary city water is generally hard to some extent, but is not as bad as that which is found in streams. Rain water is very soft and for that reason is desirable for automobile use. Many automobilists have a rain catcher on the roofs of their garages, while others depend on the old-fashioned rain-barrel. The water should be filtered first, however, if it is taken from the roof, as it is apt to contain impurities. But even with fairly soft water the monthly use of the soda solution will prevent harm.



Wire wheels is one of the requirements of the ideal car suggested by J. D. C., Jr.

The Ideal Automobile for 1913

Some of Our Readers' Conceptions of What Next Year's Car Should Be

Looks Much Like a Cup Candidate

EDITOR THE AUTOMOBILE:

The following specifications and drawings describe my ideal automobile for the coming season. The frame should be of vanadium steel and underslung construction. The suspension is to consist of semi-elliptic eight-leaf springs, 48 inches long in front and ten-leaf semi-elliptic springs in the rear. The front axle should be a B. & L. Caster design, and the rear axle floating and forged hollow in one piece.

A wheelbase of 130 inches would be desirable for easy riding, and this end should be further helped by the use of 40 by 4 1-2-inch tires in front and 40 by 5 1-2's in the rear.

As regards the engine, of course a long-stroke, Silent Knight motor would be the thing: bore 5 inches, stroke 7 inches would make a pretty good ratio and develop 50 horsepower at a moderate number of revolutions. Bosch high-tension, dual magneto and H. & M. double-jet automatic carbureter would be included in the equipment. But there should also be a single coil for starting on a storage battery, and Anderson spark-plugs. Positive force-feed lubrication together with splash for the cylinders ought to be taken care of by a gear pump, the oil tank having

Wants Average Speed of 70 Miles

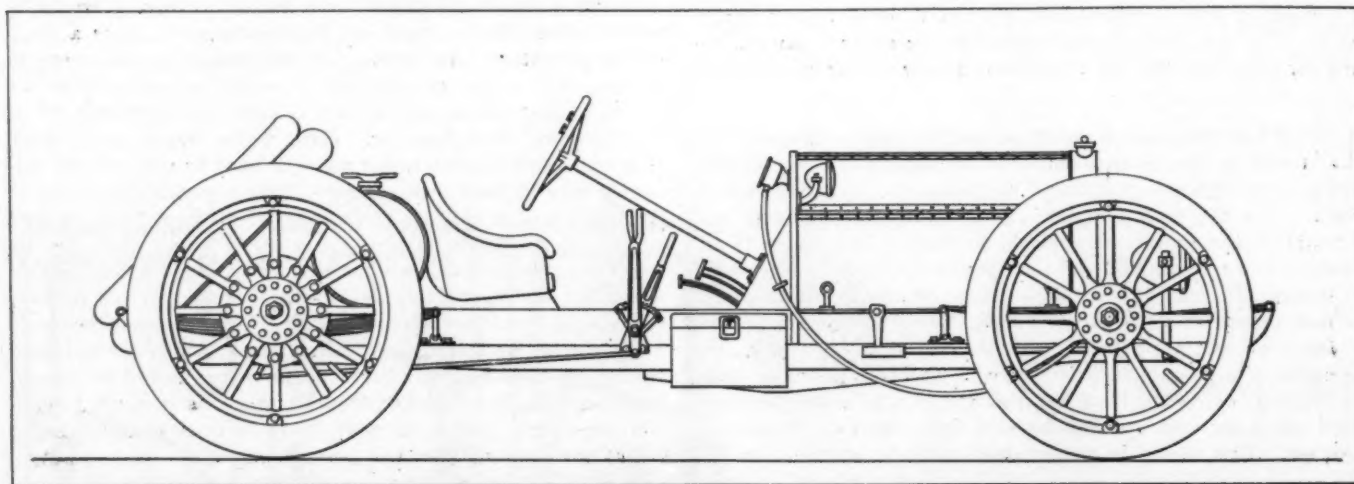
a capacity of 3 gallons. I believe in a thermo-syphon cooling system and a cellular radiator.

In my opinion a multiple-disk which runs in oil is a good design to use, and a selective four-speed and reverse transmission should be used. A spring drive between engine and clutch would be a good feature; engine, clutch and transmission should be a unit, the gear from the set to the worm-driven differential being by a shaft.

A worm-and-gear type of steering gear should be used, with a 20-inch wheel notched for the grip of the fingers. All brakes should be on the rear wheels, with the service brake pedal-operated and the emergency actuated by a lever. Spark and gas control should be on the steering wheel and an accelerator on the floorboard.

A two-passenger racing body would be my choice, the gasoline tank to be in the rear and having a capacity of 40 gallons.

The equipment should include: electric parabola head and side lights and electric tail (Neverout combination light and signal) light; all these lights to work in conjunction with a Delco system. An engine-driven, three-cylinder, tire pump attached to the



Underslung construction, a racing body and speed of 70 miles an hour are necessities, according to Fred Homan

flywheel, extra tires and rims carried in the rear, tire tool box and regular tool box—the latter on the right hand running board, and a 90-mile Jones speedometer should be included in the equipment. Under the engine should be a strong and dust-tight pan. A bulb horn and a Klaxon should be on the car, also an 8-day clock. Gasoline gauge on the dash; the switches for firing and lights should be lockable by a Yale key.

This car ought to average 70 miles an hour and cost no more than \$3,200 f. o. b. factory.

Brooklyn, N. Y.

FRED HOMAN.

Wants Specially Strong Wheels

Editor THE AUTOMOBILE:

Noticing that this interesting topic, "The Ideal Automobile for 1913," is still in progress, I here submit my ideal car for the coming year. The motor is to be a four-cylinder, the bore 5 inches and the stroke 6 inches and of the T-head type. This would permit about 60 horsepower. There is to be a three-bearing crankshaft, the bearings to be the best obtainable, and to be very heavily made. The power plant to be of the unit type. The valves should be large and the connecting parts strong and heavy, with high guides. The lubrication is to be a forced-splash feed oiling system with a 2-gallon oil tank under the hood with

hood at the back of the car; it should hold 30 gallons. In addition there should be a 5-gallon reserve tank.

The wheelbase is to be 118 inches, and the car should weigh about 3,000 lb. The cost should be about \$2,500.

The construction of body to be used is shown in the drawing accompanying this article.

Flatbush, L. I.

R. S. HORTON.

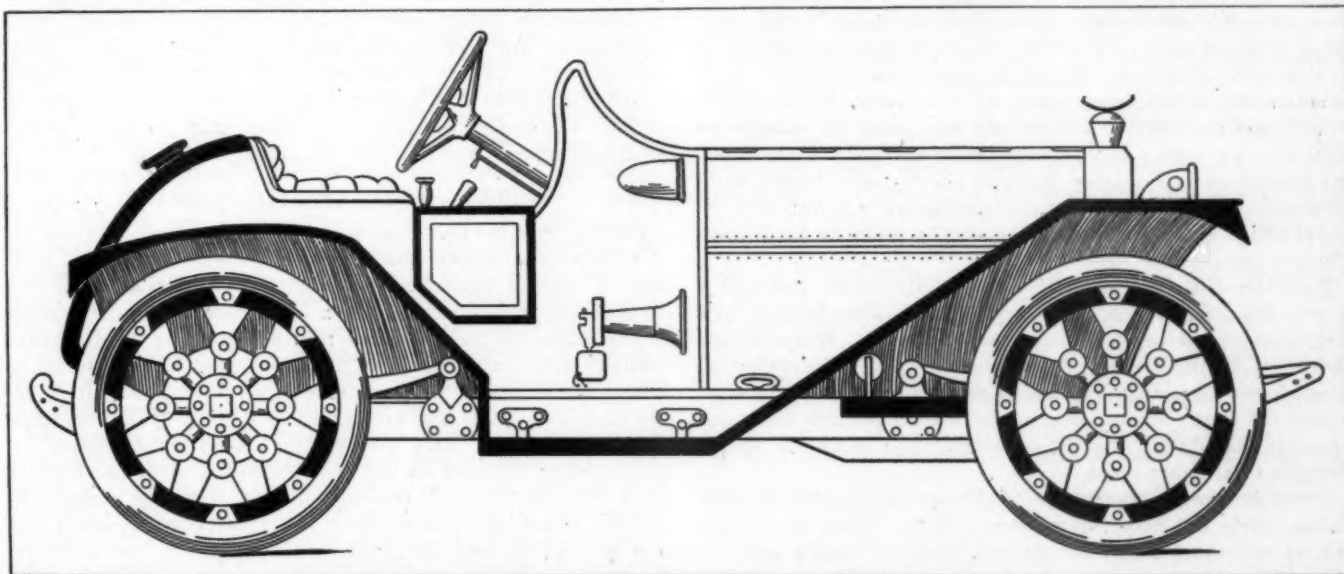
Good Car at a Dollar a Pound

Editor THE AUTOMOBILE:

Below are my specifications for the ideal car for 1913:

The motor should have four cylinders cast in pairs and the bore should be 4 7-8 inches and the stroke 7 inches. The valves should be about 2 3-4 inches in diameter, situated on opposite sides of the cylinders and inclosed. They should be adjustable. The crankshaft and the camshaft should have five ball bearings. The lubrication should be by the automatic splash system, the supply being maintained by means of a mechanical force-feed lubricator with a sight feed on the dash.

Ignition should be by Bosch magneto and storage batteries. Two sets of spark-plugs, situated over the valves, should be used. There should be an arrangement for cutting out the spark to the cylinders.



R. S. Horton believes that wheels should be made stronger and incorporates reinforced spokes in his ideal car

the cooling system of the thermo-syphon type. For ignition purposes there should be Bosch high-tension magneto with double set of individual spark-plugs for magnets and dual ignition.

The carburetor is to be a Schebler with a hot water warmer, run from the cooling system. There is to be an air exhalator on the steering post. The exhaust pipes are to be large. The transmission is to be a three-speed forward and one reverse, of the Timken type. The rear axle is to be of the Timken floating type, while the front axle should be an I-beam Timken. The brakes should be 17 inches in diameter and 2 3-4 inches in width. The rear wheels are to be of a specially constructed artillery type, with but eight spokes, each of which should be three times the width of an ordinary spoke, while the front wheels are to have only eight spokes, each two and a half times the width of an ordinary spoke. This construction, I think, would prove very strong. The drawing accompanying this article, shows the reinforced spokes.

The frame is to be of pressed steel. The brake and gear levers are to be inside of the car and at the driver's right hand. The tires to be 38-inch by 4 1-2-inch. The body would be a two-passenger with a specially constructed windshield, forming part of the body. The fuel tank should be located inside the

The cooling should be by water circulated by a pump and cooled by a radiator similar to the Metallurgique.

The clutch should be a multiple disk type running in an oil bath. It should have sixty plates. There should be a four-speed transmission mounted on ball bearings with direct on the third speed.

The car should be shaft-driven with a Timken-Detroit rear axle. The front axle should be of the B. & L. Caster type. The frame should be underslung. Semi-elliptic springs together with shock absorbers should also be used.

The gasoline tank should be situated in the rear and it should have a capacity of 30 gallons. The gasoline should be delivered to a Rayfield carburetor under pressure.

The tires should be guaranteed, size 38 inches by 4 1-2 inches. Dorian rims should be used. The wheelbase should be 134 inches and the tread standard.

The car should have six brakes, the same as used on the Isotta-Fraschini machines. The body should be a seven-passenger type, of torpedo design. The seats should be very low and slanted.

This car should weigh about 3,800 pounds and its cost should be about \$3,800.

Brooklyn, N. Y.

J. D. C., JR.

Automobile Metallurgy Made Easy

By E. F. LAKE

XVI—Nickel Steel

The Addition of Nickel to Steel Increases Its Hardness and Toughness Considerably

WHEN we pass to the alloys, nickel steel is the first to be mentioned, as more of it is used than any of the other alloys and it is only exceeded in this regard by the carbon steels. The only difference between the carbon steels and nickel steel is that nickel has been added to the composition when it is in the molten state. While native nickel is found in many localities and is quite common in meteorites, the methods used by steel makers to reduce the ore and extract the pure nickel are very expensive and hence nickel steel is higher in price than the carbon steels.

Various percentages of carbon can be obtained in nickel steels, the same as in the ordinary steels, but this is usually kept below 0.60 per cent. Thus, it is only the medium and low-carbon steels that are made into nickel steel. This is due to the fact that nickel has an effect similar to that of carbon on the hardening of the steel, although not nearly as powerful in its action. That is, it takes 17.55 per cent. of nickel to equal the hardening effects of 0.10 per cent. of carbon. As 3.50 per cent. nickel steel is usually used in automobile construction, it will be seen that this is equivalent to 0.20 per cent. of carbon and this grade of nickel steel must have the carbon content kept that much below the percentage used in ordinary carbon steels to get the same results as to hardness. In other words, a steel containing 3.50 per cent. of nickel and 0.60 per cent. of carbon can be made as hard as an 0.80 per cent. carbon steel.

Pure nickel is a white metal with a slight yellow cast and it is very hard and brittle in this condition. When treated with magnesium, however, it becomes very malleable. When alloyed with steel in the proper percentages it greatly increases its strength and toughness and makes the grain structure finer; it brings the elastic limit closer to the tensile strength than that of steels that do not contain nickel and also raises the tensile strength to a higher point.

These properties give nickel steel a greater toughness than carbon steels and make them more springy. Thus, it is better able to withstand severe shocks and torsional strains and will also show a greater resistance to compression. The term "sudden rupture" is often applied to steel and this means that the metal has broken without giving any warning. This is a phenomenon that is often met with in carbon steels, but by the addition of nickel it was overcome to a very great extent, as then the metal did not rupture as readily. The increase in price over that of carbon steel is thus warranted by the increase in strength, toughness and wearing qualities of the metal.

Nickel also has a tendency to produce laminations in steel in the direction in which it is rolled. This gives the metal a fibrous structure such as is seen in wood, but to a much less degree. Such steel, therefore, is much stronger

in the direction in which it is rolled than at right angles thereto. Fibrous steels are better able to withstand the strains that are given leaf springs than are other steels, and hence some special steels are made for this purpose. Silicon being cheaper than nickel, it is nearly always used where an extremely fibrous structure is required in steel, as by raising the silicon to from 1.50 to 2.00 per cent. the grain is given a more fibrous structure than is obtained with nickel. Nickel, however, has been used for this purpose and the higher the percentage of nickel, the greater will be the tendency of these laminations to appear in the steel.

The nickel steels used for other parts of an automobile's mechanism are usually made in such a manner or in such compositions as will overcome the fibrous structure and make them equally strong in all directions. The most commonly used brands are those that contain 2.00, 3.50 and 5.00 per cent. of nickel. Of these, however, it is seldom that any but 3.50 per cent. nickel steels are used for motor car parts.

Alloys Often Used for Valves

ASIDE from the properties mentioned, nickel tends to resist the injurious effects that are given other steels by heating. Therefore, when hardening nickel steels, they can be heated to a higher temperature than can carbon steels without causing a coarsening of the grain and thus a weakening of the metal. Neither is the metal as liable to distort when it is subjected to heat, and the higher the percentage of nickel, the more it resists the injurious effects that are caused by the heat. For this latter reason, an alloy is often used for the valves of automobile engines, which contains 96 per cent. of nickel, with the balance, or 4 per cent., of such materials as will make the nickel malleable. More often, however, a steel that contains about 0.50 per cent. of carbon, 1.50 per cent. of manganese and 35.00 per cent. of nickel is used for this purpose, as the valves are subjected to a higher temperature than any other piece on the car. For all other parts, however, the 3 1-2 per cent. nickel steels are almost always used, and such steels can readily be forged into the desired shapes and, if necessary, they can be welded.

The low-carbon nickel steels are those that contain 0.10 to 0.30 per cent. of carbon. These are usually used for carbonizing or casehardening. The various driving, differential and change-

STRENGTHS OF 31-2% NICKEL STEEL AFTER VARIOUS HEAT-TREATMENTS

Per cent of Carbon	Annealed				Hardened at 1560° F and Drawn at 750° F.				Hardened at 1560° F and Drawn at 950° F.				Hardened at 1560° F and Drawn at 1200° F.			
	Lbs. per Square Inch		% of		Lbs. per Square Inch		% of		Lbs. per Square Inch		% of		Lbs. per Square Inch		% of	
	Tensile Strength	Elastic Limit	Elongation	Contraction	Tensile Strength	Elastic Limit	Elongation	Contraction	Tensile Strength	Elastic Limit	Elongation	Contraction	Tensile Strength	Elastic Limit	Elongation	Contraction
0.10	62,000	42,100	37	62	80,000	64,500	34	77	77,000	57,800	33	76	76,100	51,500	36	76
0.20	68,100	47,500	32	58	104,400	82,400	27	67	100,800	77,000	28	68	86,500	63,600	33	71
0.30	67,200	45,000	30	54	112,000	86,000	24	63	121,000	80,600	24	58	90,500	65,400	27	63
0.40	71,900	43,000	28	49	149,700	111,500	18	54	135,300	95,000	19	53	105,300	75,300	26	58
0.60	71,700	48,800	20	46	219,500	177,800	13	45	167,500	132,000	15	40	117,400	91,900	21	46

NOTES Nickel 3.5 per cent.; manganese, 0.20 per cent.; silicon, 0.10 per cent.; sulphur, 0.025 per cent.; phosphorus, 0.02 per cent.

speed gears are often made of this steel and when properly carbonized, and hardened and tempered, it makes strong, tough gears that wear well. Sometimes a steel containing 0.25 per cent. of carbon is used for carbonized parts, but, as a rule, better results are obtained with a lower percentage of carbon. The nickel steels with a carbon percentage that is between 0.25 and 0.40 per cent. are used for such structural parts as do not need to be carbonized. rankshafts, camshafts and connecting-rods of the engine are often made of such metal, as well as the various driving shafts and transmission shafts. This is largely due to the fact that the metal withstands torsional strains much better than ordinary carbon steels.

Carbon Percentage Is Important

It is fully as important to have the carbon percentage correct as it is to have the proper amount of nickel in nickel steels, and thus considerable care is taken in the manufacture of this grade of steel. For that reason impurities, such as phosphorus and sulphur, are in lower percentages than in the carbon steels and it is seldom that 0.025 per cent. of these are allowed when the purchaser holds the steel maker to specifications that bid fair to insure good material. Steels are often obtained in which the percentage of these impurities is below 0.015 per cent. and if they could be reduced to mere traces it would add to the strength and wearing qualities of the metal.

In the use of nickel steels it is very essential that the parts they are manufactured into be afterwards hardened and tempered. Annealed nickel steels or those left in the condition in which they left the rolls in the steel mill do not have strengths or mechanical properties greater than well-made carbon steels. When given the proper heat-treatment, however, the mechanical properties of nickel steels can be made to double those of carbon steels. This is well illustrated by one test that was given a 3.50 per cent. nickel steel. In the annealed condition it had a tensile strength of 88,000 pounds per square inch, an elastic limit of 60,000 pounds, an elongation of 28 per cent. and a reduction of area of 58 per cent. By properly heat-treating it the tensile strength was raised to 225,000 pounds per square inch and the elastic limit to 224,500 pounds. The elongation was then 8 per cent. and the reduction of area 19 per cent.

The results that were obtained from a series of tests which were given 3 1-2 per cent. nickel steels that contained 0.10, 0.20, 0.30, 0.40 and 0.60 per cent. of carbon, and were hardened and tempered at different temperatures, are shown in the accompanying table. These are such results as can be obtained with modern shop practices and are not extreme cases. Much higher strengths have been obtained with nickel steels that could not be repeated regularly. On the other hand, lower strengths have been obtained, and this usually means that the heat-treatment methods or appliances were not correct and should be improved. It will be seen that very little improvement was made in the low-carbon steel by heat-treating it; but as the carbon content increases, the strengths increased enormously. Likewise an increase in the carbon content did not add to the strength of the steel to any extent until it had been heat-treated.

The various parts of an automobile are submitted to various kinds of strains and stresses and hence nickel steel, as well as any other steel, when used for these parts, must be given various kinds of heat-treatment in order to make the part perform its work properly and last the maximum amount of time. Some parts may require great hardness, with little ductility or toughness, while others might need considerable toughness without much hardness, and still others might require a condition anywhere between the two extremes. In this steel, as in all others, hardness can only be obtained at a sacrifice of toughness and toughness can only be obtained at a sacrifice of hardness, i. e., as the hardness increases the toughness decreases and *vice versa*. When nickel is added to steel it enables a greater hardness to be obtained with a given amount of toughness than can be obtained from carbon steels; and likewise, greater toughness can be obtained with a given amount of hardness.

Calendar of Events

What the Coming Months Have in Store for the Automobilist

Shows

- March 2-9..... Reading, Pa., Reading Railroad Shops, Annual Show, Dealers' Association, Inc.
- March 2-9..... Columbus, Ohio, Annual Show, Columbus Automobile Club.
- March 4-9..... Reading, Pa., Reading Railroad Shops, Annual Show, American Exposition Company.
- March 4-9..... Des Moines, Iowa, Annual Show, Des Moines Automobile Dealers' Association.
- March 4-9..... Montgomery, Ala., Track Races, Alabama Automobile Association.
- March 5-6..... Madison, Wis., First Annual Show, New Market Building, Madison Automobile Dealers' Association.
- March 6-9..... Louisville, Ky., Fifth Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association.
- March 6-9..... Tiffin, Ohio, Second Annual Show, *The Advertiser*.
- March 12-16..... Denver, Colo., Auditorium, Annual Show, *Motor Field*, A. Wahlgreen, Manager.
- March 12-16..... Syracuse, N. Y., Fourth Annual Show, State Armory, Syracuse Automobile Dealers' Association.
- March 13-16..... Muncie, Ind., Annual Show, Auditorium.
- March 17..... San Jose, Cal., Track Races.
- March 25-30..... Indianapolis, Ind., Annual Show, University Park, Indianapolis Automobile Trade Association.
- April 8-13..... Oswego, N. Y., Annual Show, Company D, Armory.
- Sept. New York City, Rubber Show, Grand Central Palace.

Race Meets, Runs, Hill Climbs, Etc.

- April 27..... Philadelphia, Pa., Annual Roadability Run, Quaker City Motor Club.
- May Santa Monica, Cal., Annual Road Race, Motor Car Dealers' Association.
- May 14 17..... Chicago, Ill., Commercial Vehicle Test, Chicago Motor Club.
- May 30..... Indianapolis, Ind., Speedway, 500-mile race.
- May 30..... Salem, N. H., Track Races, Rockingham Park.
- June 20..... Algonquin, Ill., Annual Hill-Climb, Chicago Motor Club.
- Aug. 8-10..... Galveston, Tex., Beach Meet.
- Aug. 23-24..... Elgin, Ill., National Stock Car Races, Chicago Motor Club.
- Sept. 2..... Indianapolis, Ind., Track Races, Speedway.
- Oct. 5..... Philadelphia, Pa., Annual Fairmont Park Road Race, Quaker City Motor Club.
- Oct. 7-11..... Chicago, Ill., Reliability Run, Chicago Motor Club.

Harking Back a Decade

FROM *The Motor Review*, March 6, 1902:

Delegates from nine automobile clubs met in Chicago Monday to form a national organization of clubs. Those represented were: Chicago Automobile Club, Automobile Club of America, Automobile Club of New Jersey, Long Island Automobile Club, Rhode Island Automobile Club, Philadelphia Automobile Club, Princeton University Automobile Club, Automobile Club of Utica and Grand Rapids Automobile Club.

The Chicago automobile show opened this week. Apparently Chicago has redeemed herself for the one or two unfortunate early exhibitions, as the present show is quite as splendid as old Madison Square Garden has offered. Wood and wire wheels are practically equally in favor as far as the models shown are concerned. The models exhibited number ninety-nine completed American automobiles. Water cooling is used in all but a few of the makes shown. A friction drive is presented by two Chicago manufacturers.

Late reports from Chicago relate that the national organization of clubs is to be named the American Automobile Association. Under the constitution adopted, the new organization shall be composed of clubs and each club shall be entitled to as many votes as it has members. Winthrop E. Scarritt, of the Automobile Club of America, has been elected president of the A. A. A.

THE AUTOMOBILE

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The Automobile is a consolidation of The Automobile (monthly) and the Motor
Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903,
and the Automobile Magazine (monthly), July, 1907.

Guarantees on Vehicles

A COMPANY building electric motor trucks recently sold a few of its vehicles to a western house on a 7-year guarantee and went so far as to underwrite this guarantee. Not long after the vehicles were delivered the manufacturing company went into receivership and the stockholders, as a personal protection, had to place a mechanic at their own expense to keep the vehicles running and they expect to have to do this until the expiration of the guarantee. This is an extreme case, but it shows the extent to which some manufacturers are going in these days in order to make a few sales. The old expression of guaranteeing for 1 year, or for 2 years, has passed away and now the 5-year, the 7-year and the life guarantee are taking its place.

The question of guarantee seems to be entirely on the side of the buyer so far as advantages of it go. The buyer acknowledges that the motor vehicle is new to him, that his help is not familiar with it, that he is entirely ignorant of it, that his place is not well suited to it, and yet he asks for an ironclad type of guarantee. He does not want to place the expert driver or mechanic on the truck or delivery wagon he is to buy, but wants to put an old horse driver on the job. But in spite of this he wants the guarantee; he thinks that the motor vehicle man must pay all. What could be more absurd? He wants the truck builder to cut prices; he wants him to teach him how to operate it; he wants him to keep the truck in repair, and then, last of all, he wants it guar-

anteed, although the operation is entirely under his control.

Where a truck maker or dealer gives a guarantee he should insist on a reciprocal written guarantee from the buyer that it will only be operated according to the rules laid down by the dealer. If a dealer assumes responsibility for a truck the man who drives should be responsible to the dealer and not to the truck owner. The dealer should have a written guarantee from the owner covering the speed at which the truck should be operated; he should also have a written guarantee from the owner covering the speeds at which it should operate, and he should also have a written guarantee covering the attention and overhauling that the machine is to receive. This is but a bargain.

Why should the truck maker provide the means of transportation, constitute himself a tutor on truck operation; become an expert on transportation for the individual, and lastly, guarantee everything? The truck buyer must bear his share of the burden. He is not buying trucks with the philanthropic idea of keeping the truck maker in business and also keeping the dealer in business. When the buyer purchases a truck he buys it because he expects to make money out of it; he expects that transportation with it will be cheaper than with horses. But this buyer does not want to take a solitary chance. He wants to be protected on every hand. He wants to hedge himself around with insurance policies against possible loss. He wants insurance against the ignorance of his own drivers; he wants insurance against the shortcomings of his own loading and unloading facilities; he wants insurance against the mistakes of his own help, and with wanting all of these he does not want to pay even a premium. His viewpoint is insurance without even an examination or annual premium.

Where the buyer is so bent on guarantees on trucks and delivery wagons why should not the truck maker ask for a premium? Let the truck maker offer to guarantee, but let the buyer pay rationally for it. If the truck maker has the confidence in his vehicle he should have he will not be afraid of its ability to stand up, but he has not any right to endanger his business without a fair recompense.

What does this same buyer do in other lines of purchase? Does he get a guarantee on all of the silks and fabrics he purchases as to their wearing qualities or has he to depend on the ability of his buyers to protect him in this matter? Does he get a guarantee on the bricks he purchases to build his warehouse with or has he here also to depend on the ability of his purchasers?

Motor truck makers might as well become aware of the fact at once that if they have to educate the business man to the truck, feed him so to speak, and if they also have to keep his machine running, and if they have to teach him how to use it, and if they have to tell him what systems he should install to handle his goods, then they must be paid for their labor. If a truck cannot stand upon its own merit, let the truth be known; but if it is necessary to hang a dozen other baits to the vehicle in order to make a sale the price had better be placed at an adequate figure so that a rational business profit can be made. That business which has not rational profits cannot continue. The truck maker who hopes to give away his profit in order to make a sale cannot continue in business and be a healthy member of the industry.

Helps Canada Road Makers

Paul Sargent Addresses Meeting That Wants \$50,000,000 for Roads To Increase Automobile Tax

TORONTO, CAN., March 1—Paul D. Sargent, assistant director of goods roads for Washington, addressed a meeting of the Ontario Good Roads Association last Tuesday. The convention was held for the purpose of getting into concrete form a proposition that would aid the federal and provincial governments in drafting a feasible policy for the distribution of the appropriations contemplated. The convention passed a resolution asking the Dominion government to set aside \$50,000,000 for the purpose of assisting good roads, requesting the Ontario Legislature to appropriate \$10,000,000 and suggesting comparatively generous contributions from the county councils. A tax of \$10 to \$25 on automobiles, according to horsepower, is also proposed.

Louisiana's Governor a Road-Builder

NEW ORLEANS, March 3—With Governor J. Y. Sanders and some of the most representative residents of the state actively interested in a company that is to devote its entire capital to the improvement of roads, motorists in Louisiana are considering that they are exceptionally favored. Governor Sanders is the president and general counsel for the company. All the rights and titles to patents of the Petrolithic Company of California for the fourteen southern states, including Louisiana, have been acquired by the new company. The engineer and manager of the new organization will be Howard Eggleston, of Chattanooga, an engineer of national repute. Other officers of the concern are: T. P. Thompson, vice-president; E. L. Chappuis, secretary, and Andrew Fitzpatrick, treasurer. Among those interested in the organization of the road building company are: T. P. Thompson, Andrew Fitzpatrick, J. B. Sinot, E. L. Chappuis, W. B. Thompson, C. A. Hartwell, A. Aschaffenberg, Walter Danziger, Frank S. Levy, Dr. J. A. Danna and Frank Legier.

Trunk-Line Roads for Mississippi

JACKSON, MISS., March 3—A bill providing for three great trunk-line roads through Mississippi has been introduced into the state Legislature. The three roads will radiate from Jackson, the capital, to different sections of the state. The bill specifies that the roads are to be modeled after the most improved plans to be submitted by the federal government. This measure is the result of the activity of owners of motor cars in Jackson. It is stated that during the greater part of the year motorists are limited to the city streets of Jackson due to the impassability of the roads in the rural districts. The bill will come to vote early in this month and it is expected that little opposition will be offered.

Galveston-Winnipeg Road Proposed

GALVESTON, TEX., March 3—A road from Winnipeg to Galveston, to be known as the Meridian road, is receiving serious attention on the part of Galveston motor car owners. The activity has been prompted by a letter from the Watertown Automobile Club, of the South Dakota Association. It is requested that Galveston motorists notify the organizations in Texas which would be benefited by the proposed road and that immediate steps be taken to make the meridional highway a fact. Long stretches of graveled road already built can be used in portions of Texas and Oklahoma. A tour from Galveston north over the route is being suggested for the early spring.

Want Universal-Light Law

Milwaukee Believes All Vehicles Should Be Placed on Same Plane With Automobiles in This Respect

MILWAUKEE, WIS., March 2—At the instance of the Milwaukee Automobile Club, an ordinance has been proposed in the common council of Milwaukee, Wis., requiring lamps to be displayed on every vehicle on any public highway, bridge or alley within the city limits, during the period from one hour after sunset to one hour before sunrise. The entire strength of 4,000 motorists in Milwaukee is being gathered by the motor club to force the passage of the measure, which undoubtedly will have strong opposition from teamsters. The original ordinance makes an exception of vehicles which carry as principal freight hay or straw, kerosene, gasoline or other like combustible or inflammable substances.

The Three A's Is Ten Years Old

The tenth anniversary of the formation of the American Automobile Association was marked by the giving of an enjoyable luncheon at the Hotel Manhattan Monday by a round dozen of prominent automobile men. A. G. Batchelder, chairman of the executive committee, was the guest of honor and was presented with a golden remembrance. Among those present were Alfred Reeves, Horace A. Bonnell, Samuel A. Miles, W. J. Morgan and a few others.

Wisconsinites Slow to Register

MILWAUKEE, WIS., March 2—On March 1, only 8,337 motor cars had been registered in the office of the secretary of state of Wisconsin under the new law providing for the re-registration of all cars on Jan. 1, 1912, at an increased fee of \$5.00 annually. This number does not include the 300 dealers who registered at the same rate. The reason for the light registration is that thousands of cars are in winter quarters and owners are taking their time about sending \$5 to Madison for the two number plates. The secretary of state estimates that the 1912 registration will run up to 25,000, the figure being based on the total registration up to Jan. 1. The estimated number of cars in Milwaukee is 3,750 and more than half are carrying the new license tags.

Metal Signposts for Pennsylvania

HARRISBURG, PA., March 2—The state commissioner of highways, E. M. Bigelow, early this month will ask for bids for metal signposts and boards to be placed at crossings and other necessary points all over the state. The engineering office of the department has located the spots where the boards are desired. The deficiency of proper guide signs along the highways was one of the first things that struck Bigelow when he took charge of the department last summer.

Several important surveys of main highway routes in the Sproul good roads bill were begun by State Highway Department engineer corps this week and as the weather has become fairly open it is expected that there will be fine progress made.

MINNEAPOLIS, MINN., March 2—Tentative routes are being suggested for the annual tour of the Minnesota State Automobile Association which will start this year from St. Paul. One proposed route is by way of Wadena, Crookston and St. Vincent to Winnipeg, returning by Grand Forks and Glenwood to the Twin Cities, a 5-day tour.



Accessories were seen in nearly a dozen different parts of the building

Some Accessories Shown At the Boston Show

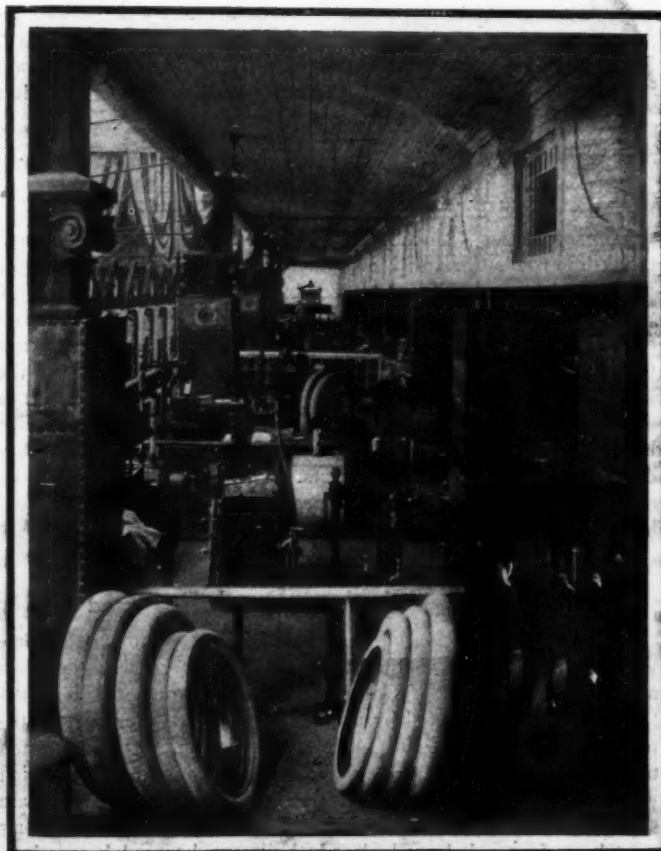
(Continued from page 653.)

American Thermo-Ware Company, New York City—This concern makes and imports automobile goggles, horns and specialties. Goggles of every conceivable type and cases to keep them in are handled by this company. The prices range from 25 cents to \$5. Thermometers for vulcanizers in a nickel-plated case 2 3-4 inches long are also sold. The Autocrat autoscope is a dash mirror by which any object in the rear may be seen without turning the head. The mirror is fitted on a heavy polished brass frame with a ball-and-socket joint so that it can be adjusted to suit any driver. It requires the use of tools to remove it from the car, so that it cannot be readily stolen. The mirror is 5 inches in diameter. Autocrat automobile horns are of the multiple reed bulb type. The air is distributed by valves to the different horns so that a bugle-call effect is produced. Hydrometers, flower vases for limousines, grade indicators, spark-plugs and folding seats are among the articles imported by this company.

Auto Time-Saver Repair Kit Company, Boston, Mass.—The Time-Saver repair kit consists of a steel wire spreader for spreading the cut in the tire apart; a punch for cutting a round, smooth hole about the place to be repaired; a set of rubber-coated soft-metal buttons and a pair of powerful tweezers. The button is inserted in the hole and then squeezed tightly against the rubber. The time required in making this repair is about a minute.

Chelsea Clock Company, Boston, Mass.—Four styles of clocks are made, known as the Special, Offset, Round and Limousine. They are all 8-day clocks. The Special is a rectangular dash clock, while the Offset and Round are two styles of round dash clocks, the Offset projecting further from the dash than does the Round. The Limousine clock is a round style especially adapted for the type of car whose name it bears. All these clocks are made in 2 3-4 and 3 1-2-inch diameter dials.

Codman & Shurtleff, Inc., Boston—C. & S. tire pumps are of heavy seamless brass. All but one of the pumps is heavily nickel-plated, with polished barrel. A water-jacketed power pump is also made by this concern. The power required to run the pump is about 1-6 horsepower. It is a single-cylinder type and is made to bolt to the floor.



Tire makers were well represented at Boston show



Main aisle of accessories above Exhibition Hall where many accessories were shown

Columbia Lock & Bolt Company, Bridgeport, Conn.—Columbia lock nuts are of two types. In order to eliminate the possibility of the nuts shaking loose from vibration or other causes they are so constructed that they do not depend on the frictional resistance of the bearing surface alone for their support. The nuts are built in two parts; the inner part carries

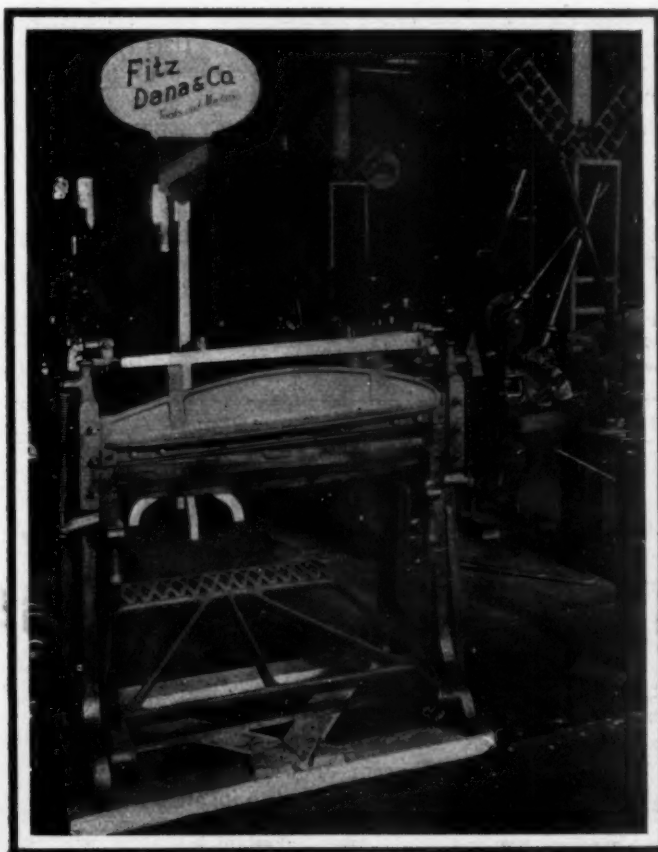
the thread and is slotted. The two parts of the nut known as the Original Type are so tapered as to fit together. When the wrench is applied to the exterior of the outside part in the usual manner, the inside part will travel down on the tapered sides which form a wedge and closing the slot force the thread of the nut to the bottom of the V in the thread, thus effectually locking the nut. In the Improved Type the same principle is made use of, except that the taper is formed by a truncated cone. The nut is operated in a similar manner and locks in the same way.

Connecticut Steel & Wire Company, Hartford, Conn.—The special trunk racks for any type of car are compact and, wherever possible, adjustable and folding. The framework of the racks is of flat steel pieces riveted together. The black enamel finish is baked on. The Standard automobile trunk is of black enameled duck over a steel frame, the edges and corners being bounded by heavy riveted harness leather. It is of rectangular shape.

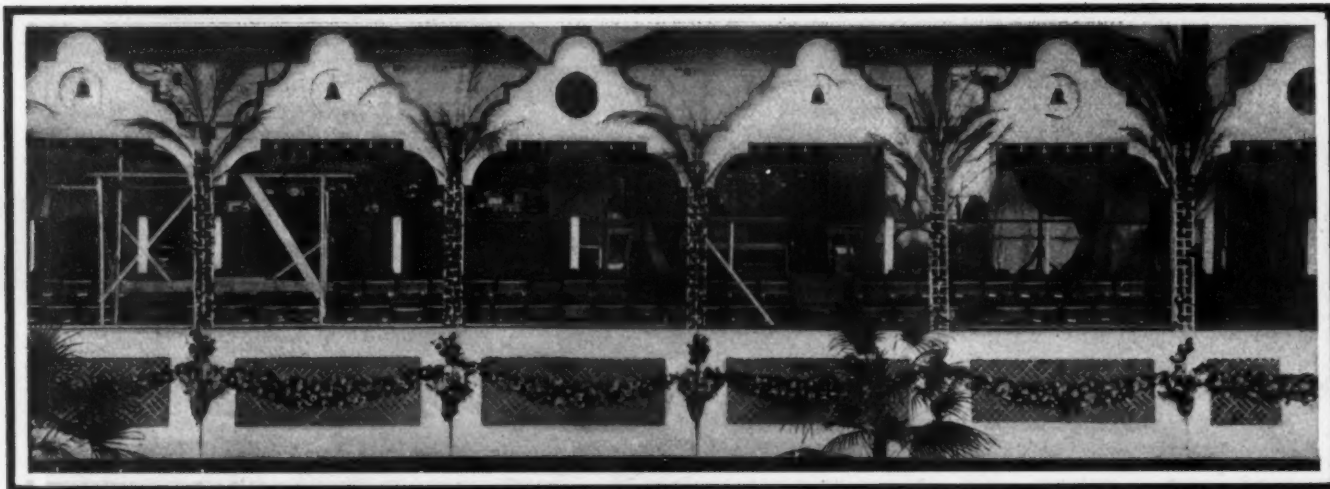
Empire Top & Windshield Company, Boston, Mass.—Empire windshields, custom tops and slip covers are made by this concern. The windshield is designed to deflect the currents of air above the head of the driver so that he can look over the windshield instead of through it. The material from which the shield is made is of celluloid with brass bindings. The shields are made in sizes to fit any make or model of car, and they can be attached to any form of dash by cutting out the filler board to fit. The shield is adjusted by means of telescopic stays.

Havoline Oil Company, New York City—A new truck oil is added to this line. It is a mechanically filtered oil from which the greatest possible amount of free carbon has been removed.

Hazen-Brown Company, Boston, Mass.—Rubber compounds and vulcanizing outfits are specialties. For the automobilist there is everything in this line from tubes of cement to complete vulcanizing outfits. A cold vulcanizing outfit, known as Pluto, is specialized. It consists of a 4-ounce bottle of vulcanoid acid, emery cloth, two brushes and three rubber repair buttons all packed in a wooden box with full directions. Nut-tread is a rubber compound in plastic form put up in a collapsible tube.



Machinery exhibits were new among the accessories



The decorative effects around the balcony of Mechanics' Hall were along Spanish lines

Kuehn & Metz, New York City—This concern manufactures the Excel 4, 6 and 8-volt ignition storage batteries. Hard-rubber separators are used between the elements in order to insure perfect insulation, while a large sediment chamber is provided so that short-circuiting from sediment will be eliminated. Means are also provided to do away with the creeping and leakage of the acids, thus preventing the corrosion of the terminals. The vents are so constructed that a free escape of the gases is allowed, while at the same time the evaporation and tendency to spill of the electrolyte is eliminated.

Milwaukee Bronze Casting Company, Milwaukee, Wis.—The Electric Star searchlights are featured. The lamps are all double focused, so that the sides of the road as well as the part directly ahead of the car are shown up. The material used is thick, non-corrosive silvered aluminum.

National Enameling & Stamping Company, St. Louis, Mo.—The products manufactured by this concern which are of greatest interest to the garage and automobile owner are oily waste cans, oil tanks, gasoline tanks, storage tanks, funnels and measures. The oily waste cans range from 10 3-4 inches diameter by 11 1-2 inches high to 23 1-2 inches diameter by 29 inches in height. The gasoline tanks are galvanized and japanned and have corrugated bodies and bottoms. The capacities are from 36 to 111 gallons. The oil tanks have capacities of from 30 to 106 gallons and each tank is furnished with 1-pint, 1-quart and 2-quart measures, besides a 1-quart funnel. These tanks are suitable for those who either store or sell oil. The storage tanks range from 15 to 60 gallons in capacity, and have a brass faucet at the bottom. They are of cylindrical shape as are the other tanks above described. The automobile funnels are extra large, having a diameter of 12 1-4 inches and being fitted with a brass wire strainer and an extra hoop to fasten chamois.

Noera Manufacturing Company, Waterbury, Conn.—Brass specialties of all kinds for automobile work are made by this company. Pumps, oilers, oil and grease guns as well as a complete line of lamps are but a part of the output. A compound automobile tire pump under the name New Ideal is manufactured.

New York Wire & Spring Company, New York City—The Asco horn-bulb protector consists of a close, conical wire coil to enclose the lower part of the bulb. A broken bulb may be used with the protector by winding a piece of tape about the bulb and then fitting the protector. The protectors are made so that one size will fit any size of bulb.

Post & Lester Company, Boston, Mass.—Automobile supplies of all kinds are carried. Royal, Solar, Rushmore, Gray & Davis lamps; burners, electric gas igniters and other lamp requisites; Volier, Sireno, Saxon, Klaxon and Jericho horns; all standard makes of tops, trunks, trunk racks, windshields, jacks,

shock absorbers, clocks, speedometers, brake lining, spark-plugs, Schebler, Holley and Stromberg carbureters; dry and storage batteries, coils, switches, tools, goggles, tire repair kits, tire chains, pumps, oil tanks, cans and pipe connections feature the line along with all the latest specialties.

Royal Equipment Company, Bridgeport, Conn.—The Gyrex is a small device for the purpose of breaking up the gasoline spray as finely as possible in order to secure more perfect vaporization. It is a small German steel turbine mounted on a tubular flanged shell with an integral tripod. At the center of the tripod there is a ball bearing which supports the turbine and upon which it turns. The turbine has six blades which are perforated by a number of small holes. The Gyrex is placed in the intake pipe and when the motor sucks in a charge it starts the turbine spinning, which in turn breaks up the gasoline globules into the smallest possible particles, thus tending to give uniform mixture in all parts of the cylinder. It is best adapted to be fitted at the Y in the intake manifold and when fitted here, the pipe will not have to be cut in any way. It is claimed by the makers that a saving is made in the amount of fuel consumed when this device is used.

Sears-Cross Company, New York City—The Spedindicator, made by this concern, comes in five models, the prices ranging from \$35 to \$90. The products themselves vary in finish and equipment. Three styles of finish are used—polished brass, full nickel and S-C black, which is not a gun-metal finish, but a special finish. The equipment with which the circular-dial instruments are fitted consists of clocks and electric-lighting attachments. The light is so arranged as to illuminate the dial when required, while the clock is placed above the dial in such a way that it is illuminated at the same time as the speed indicator.

Universal Manufacturing Company, Minneapolis, Minn.—The O.B. gear-driven air compressor is a tire pump which is designed to be a permanent fixture of the car to which it is applied. It may be used for the operation of air starting devices if desired. The gear operates a crank which in turn is connected to a connecting-rod. The piston, which is operated by means of the connecting-rod and a wrist pin, is fitted with two rings in each end. The pump is double-acting, delivering air to the outlet at each stroke and will readily deliver a pressure of 250 pounds. The valves used on the device are of the bevel-seated type, while in appearance the pump is a small cylinder with the gear driving wheel located on one side and the outlet pipe above. It can be mounted on the frame of any car and fittings are furnished by means of which the pump may be attached. The compressor is guaranteed to inflate a 36 x 4-inch tire in a minute and a half.

Ames Automobile Truck Jack, Franklin, Pa.—Owners of cars are realizing more and more the value of taking the car

weight off the tires when in the garage. The Ames jack is intended for lifting the front wheels off the garage floor. The axle is carried on the two arms, which can be screwed to the desired height to take the axle and then locked. The ready position of the jack is obtained by unhooking a latch which breaks the back of the two cross-arms and tilts the arms forward and lowers them so that the car can be driven onto them. A few inches further movement of the car carries the arms into the vertical position, lifting the car wheels off the floor and bringing the jack into the up position, where it is locked by the latch, the hooked end of which enters a locking slot in the rear cross-arm. In case it is not satisfactory to drive the car onto the jack, a short handle is furnished in order to place the jack under the car and elevate it. A car with both axles on such jacks can be wheeled to any place in the garage.

Atlas Chain Company, Brooklyn, N. Y.—Gaylor-Atlas grips for dual and single solid-rubber tires consist of four chrome-vanadium steel hook-shaped cross links, placed at an angle of 90 degrees to one another around the tire. These are united by chains, Fig. 6, excepting in one place where a strap is used for attaching and detaching.

G. C. Blickensderfer Company, Stamford, Conn.—In the Bull's-Eye spark-plug there are three very small circular glass windows in the hexagonal head of the socket and, whenever the spark jumps the gap at the spark points in the lower end, the light shows through these windows. It constitutes a ready means of discovering if the plug is in working condition. There is not any special spark-gap in the plug, the light of the spark showing through the glass.

Davies Manufacturing Company, Detroit, Mich.—The combination spring and rubber tire for pleasure cars and commercials is attracting attention, two exhibits containing these. In both, a series of springs is used within a hollow channel felloe. Some of the springs are mounted radially, some obliquely circumferentially, and the resilience of these is claimed to compensate for pneumatics. In the Comfort wheel, a California invention, there are three springs, a stout radial, an arc-shaped leaf spring and two diagonally-placed coil springs. An ordinary wheel has about six series of these within the felloe. These springs are all placed between the wood felloe and a flat band which carries the solid rubber tire. The load is carried on the radial and arc-shaped springs and the diagonal coil springs besides aiding in this work. The torque is transmitted from the wood felloe to the outer rim by the arc-shaped springs as well as through the diagonals.

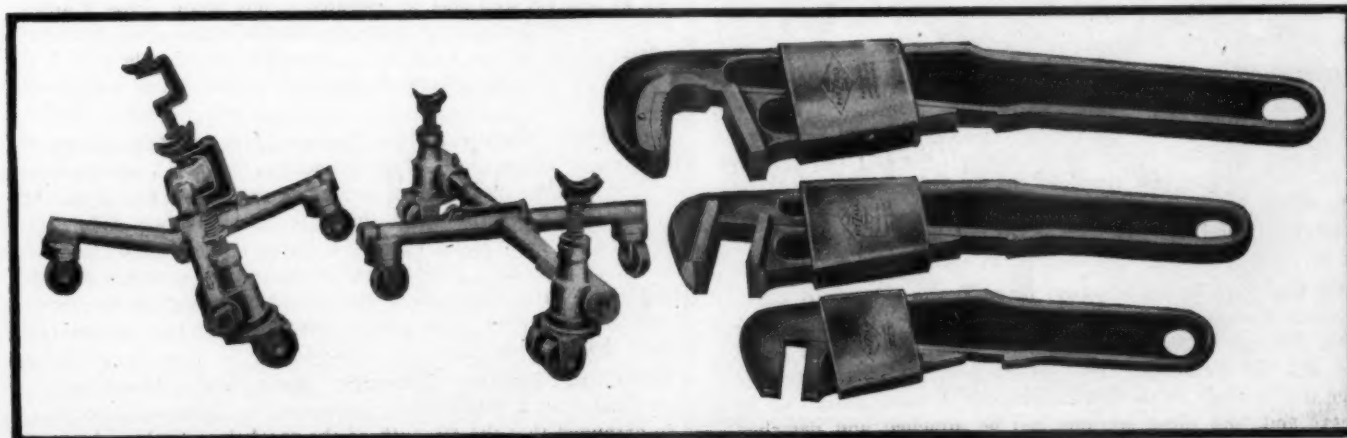
Detroit Tool Company, Detroit, Mich.—Perhaps one of the most useful garage machines seen is the portable blacksmith shop. It is a combination tool mounted on a four-caster truck so it can be drawn from one part of the garage or repair shop to another, or taken out on the street or alley beside the car. It contains a forge, an anvil, a vise, a pipe vise, an emery wheel, a

drill, a circular saw and other combinations. The forge has a fire pot at one end 16 inches deep with a rotary blower in combination; the anvil is 13 inches long, with a 4 by 6-inch polished face and is made from chilled manganese iron; the vise has 4-inch jaws opening 8 inches; the movable part of the vise constitutes the anvil; the pipe vise will take any pipe from 1-3 inch to 3 inches in diameter; the emery wheel is 5 inches in diameter; the drill press is geared 2 to 1 and is fitted with a Barber adjustable chuck to take all drills up to 1-2 inch. Other equipment is furnished.

Hartford Pump & Manufacturing Company, Boston, Mass.—The Hartford tire pump is a double-acting, single-cylinder pump driven by the motor. It is said to pump 1 1-2 cubic feet of pure air per minute when running at 500 revolutions. It weighs 10 pounds, is gear-driven, has a vertical height of 9 1-2 inches, a width of 3 1-2 inches and is tested to a pressure of 150 pounds. A split gear is given with the pump, this gear being intended to clamp onto the magneto or pump shaft of the car's motor. The pump itself bolts to the car frame by two 3-8-inch bolts. The pump has a sliding gear which can be meshed with the clamping gear on the pump or magneto shaft when the pump is used, and when not in use the pump is idle.

Margaret E. Knight, South Framingham, Mass.—There is another Knight motor invented by a Miss Margaret Knight, whose last name is spelled the same as that of Charles Y. Knight, whose fame as the inventor of the double-sleeve motor is international. Seen for the first time at a show is Miss Knight's invention, known as the K-D motor. It is of four-cylinder design with 4-inch bore and 6-inch stroke. It is a non-poppet type with a reciprocating sleeve at one side to admit the mixture and a similar sleeve at the opposite side to liberate the exhaust. Each sleeve is semi-circular. In a word, each is of the same shape as a length of stove-pipe divided in halves by a cut from end to end. These sleeves are reciprocated 2 inches at a one-to-two movement, or at half crankshaft speed, and are located between two stationary cylinder walls. The piston reciprocates within the inner cylinder wall. The outer cylinder is water-jacketed and is cast integrally with the cylinder head and is removable. When removed it exposes the two sleeves, the stationary inner cylinder and the top of the piston.

But this motor has one more peculiarity, namely, that the bottom of the main or inner cylinder is inclosed beneath the piston and is also water-jacketed, and the exhaust gases, instead of being liberated direct from the combustion chamber above the piston are conducted to the space beneath the piston and used to force the piston up, thereby acting more or less as a double-acting motor. In order to do this the main piston is on a steam type of connecting-rod which passes through a stuffing-box and to the lower end is attached a second connecting-rod that unites with the crankshaft. The motor on exhibition has not run very much. No information as to its rating is attainable at present.



Ames automobile jack-truck

Fitzall pipe and nut wrenches



Hume windshield fitted to Cadillac car

C. S. Knowles, Boston, Mass.—The basic principle of the Hartford spark-plug is that when the wire terminals at which the spark occurs are heated and expand, the gap which the spark must bridge remains the same. It has two hook-shaped wires and a semi-spherical electrode. When the arc-shaped terminals are heated they expand on a tangent to the surface of the central electrode, thus maintaining the same length of gap. Using two arc-shaped wires affords a double path for the current.

Lunt-Moss Company, Boston, Mass.—The Lunt-Moss air compressors for garages are air-cooled single and twin-cylinder types. The single-cylinder compressor has a cylinder 1 13-16-inch in diameter with a piston with 2 1-2-inch stroke. It is guaranteed to maintain a pressure of 100 pounds to the square inch. The safety valves are set at a pressure of 70 pounds. This compressor may be run by belt, gears or chain and should operate at 300 revolutions per minute. It has an overall height of 13 inches. The twin-cylinder compressor is practically a duplicate of the single-cylinder in all specifications.

National Rubber Company, St. Louis, Mo.—Tirenew is a paint applied by brush over the outside of a tire and is claimed to fill up surface cuts, to keep moisture out of cracks, etc. It is made in gray and white, and is put up in gallon, half-gallon, quart and smaller cans.

O-Tak-A-Tire Remover, Leroy, N. Y.—The O-Tak-A-Tire tool is used to remove tires from Q-D rims. The tool clamps under the felloe and, by working the handle, a plunger forces removable ring inwards towards the inside of the wheel and locks, permitting the workman to use two hands.

Standard Wrench & Tool Company, Providence, R. I.—The Litzall ratchet wrench is made on the inclined-plane principle. The stationary jaw is part of the handle, and the movable jaw is pivoted to a wedge-shaped sleeve. The inner face of the movable jaw rides on the smooth, inclined face of the handle. To anchor the wrench to a nut or piece of pipe the weight of the movable jaw carries it down into the position; to release, it is only necessary to pull up on the handle.

Steel Cushion Tire Company, New York—The Ellis cushion wheel has an interconnected diagonal spring system extending throughout the entire annular space between the wood felloe and the metal rim carrying the tire. In this wheel the rubber tire is made in about six or seven sections, instead of an endless band, and these sections can be attached and detached

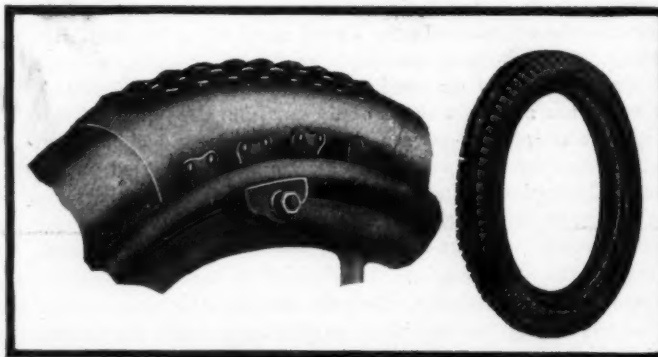
separately. The felloe carries throughout its circle a series of short levers fulcrumed on a radial support on the felloe. Each end of each lever hooks into a spring to give a continuous spring and lever linkage around the felloe. On one end of each lever is a pivoted yoke-piece in the yoke end of which rides a segment of the rim carrying the rubber tire. Each segment rides on a set of three yokes.

Travers Blowout Patch Company, New York City—The Travers patch is made from highly compressed Sea Island cotton, covered with high-grade rubber vulcanized by the slow, live-steam method. The patch fits inside the shoe and is made to stay in position as long as the shoe itself lasts. It has a roughened surface which increases its holding power and the pliable ends stop it from chafing the inner tube.

Tyer Rubber Company, Boston, Mass.—Tire devices are being brought out all over the country and this show has its quota of new ones. Reference is made here only to styles not seen at previous shows. The Tyrian anti-skid tire has a plain central tread strip made of a high percentage of para rubber. At either side of it is a circumferential slot, wider at the bottom than at the top, so that with the compression of the center tread strip mud and dirt are forced out of the circumferential slot. In a word, the slot is claimed to be self-cleaning. Outside of the slot is a series of short slots at right angles to the circumferential one.

Utility Tread Company, Endicott, N. Y.—An external blowout patch is the Utility. It is a steel-studded fabric-rubber arc-shaped patch, with curved steel hooks at each side to fit under the lip of the clincher rim.

Wilson Instrument & Specialty Company, Passaic, N. J.—Under the trade name of Wisco several all-metal oil and grease plunger guns are made. The No. 5 can be used for either oil or grease, and is made of seamless brass tubing with a metal plunger ground to fit. The spout is 6 inches in length and is



Blow-out utility patch. Tyrian Hold-tite anti-skid tire

of flexible tubing. No. 3 may be used also for oil and grease and a 12-inch combination flexible oil and grease spout is provided so that the gun may be operated at any angle. Nos. 1 and 4 are both all-metal guns with detachable piston and nozzle. In using these grease guns for a reservoir the nozzle may be removed and a plug placed at the end of the barrel in place of it.

Windshield Manufacturing Company, New York City—The Mezger automatic folding windshield can be folded with one hand without the use of a wrench or the necessity for turning any nuts or bolts. The shield is made in two different styles, one of which is known as the spring type, while the other has a friction lock. The frame is of special seamless brass tubing 7-8 inch in diameter. Felt is used as a cushion in place of rubber, and there is no cement which has to be dug out to replace the glass in case it is broken.

Witherbee Igniter Company, Springfield, Mass.—The Wico igniter is a high-tension generator for ignition uses and is so arranged that the strength of the spark is entirely indepen-

dent of the speed at which the device is driven; that is, a spark of the same temperature is generated whether the motor be turned over by hand or whether it be running at full speed. The current is generated by the reciprocating movement of two soft-iron armatures which move alternately in and out of contact with the soft-iron cores. The movement of the armatures in the upward direction is due to the motion of the motor, while the downward movement, which produces the spark, is caused by the action of a spring, being faster than the upward movement and entirely independent of the engine. Witherbee ignition storage batteries have rectangular hard-rubber jars and carrying cases, and range in capacity from 6 volts, 70 amperes to 8 volts, 45 amperes. The lighting batteries are in three-compartment rectangular jars of hard rubber. They range from 6 volts, 60 amperes to 6 volts, 100 amperes.

Soaps and Polishes

MANY brands of soaps and polishes for the automobilist are on the market, some intended for metal parts of the car and others for the body. Soaps have for basic substances linseed oil, corn oil, petroleum oil, cottonseed oil, peanut oil, olive oil and a few others. The following were represented at the Boston show.

For automobile soaps linseed oil has been extensively used, but within recent years this has become so expensive that manufacturers have had to resort to other bases in its place. Corn oil, which is very much cheaper and which is claimed by many to be just as good as linseed oil for the purpose, has come to be used in a great many of the cleaning compounds.

In addition to the oil base, there is a cleaning agent, such as ammonia, for getting at the dirt. Tallow is often used to give body to the mixture, while cocoanut oil is sometimes included to get at the root of the dirt, so to speak. It is very penetrating and loosens up the particles of dirt or grime. Pumice finds extensive use in the grime soaps which are used for the removal of grease and oil common to machine shops and garages.

Oil of lemon has been found to be a very good agent for polishes, although its cost prohibits its use in such compounds. It is very volatile, which is an important factor in a good polishing material. The liquid must dry quickly in order that the rubbing on which all polishes depend may be of effect. Next after the more expensive lemon oil, as an ideal substance for polishes, is olive oil. This is used to a considerable extent.

Rome Soap Manufacturing Company, Rome, N. Y.—Among the automobile soaps on sale are those known as the Three B products. This brand is made of vegetable oils and is claimed to be free from alkalies and injurious acids. No chamois is needed in polishing a car which has been washed with this article, and lather is formed by putting a small quantity of the soap into a pail and pouring into it a stiff stream of cold water.

The Three B metal polish is made according to an emulsified formula and requires no shaking beyond the tipping of the can in ordinary use. Three B hand soap is compounded specially for automobilists and mechanics. For cleansing garage floors, a washing powder of this name has been brought out.

Hopewell Brothers, New York—Takoff is the rather suggestive name of a pumice soap paste which is made by this concern. This compound, as well as Paos, which is another of the firm's soap specialties, has a cocoanut oil base and there is also tallow included in the makeup. The grit in the first-mentioned product is much coarser than in the Paos brand, making the former specially adapted to the service of removing greases and grime accumulated while working on the machinery of the car.

White & Bagley Company, Worcester, Mass.—An anti-septic hand-cleaner for mechanics and automobilists, is manufactured under the name of Cleanzum by this company, which makes the Oilzum products. In all its soap products this com-

pany makes use of corn oil. For cleaning varnished and painted surfaces, such as automobile bodies, Washzum oil soap has been brought out.

Solarine Company, New York—Solarine metal polish, designed to remove dirt and tarnish from all bright metals, such as gold, silver, brass and copper, is a white liquid with a volatile oil base. For polishing dark articles, such as leather parts of tops, straps and for the removal of dirt from seat leather, Solarine black liquid metal polish may be used. Being black it does not discolor the stitches of straps or other leather goods.

H. B. Sawyer & Company, Boston, Mass.—For cleaning the body and varnish of the car this concern has a soap which is of the linseed oil variety. Ideal metal polish for tarnish and dirt on brass and nickel parts is also made.

International Metal Polish Company, Indianapolis, Ind.—An automobile body gloss in the form of a greaseless cream is a product of this company. It is made with the idea of restoring the luster and reviving the brilliancy of the highly polished body surface.

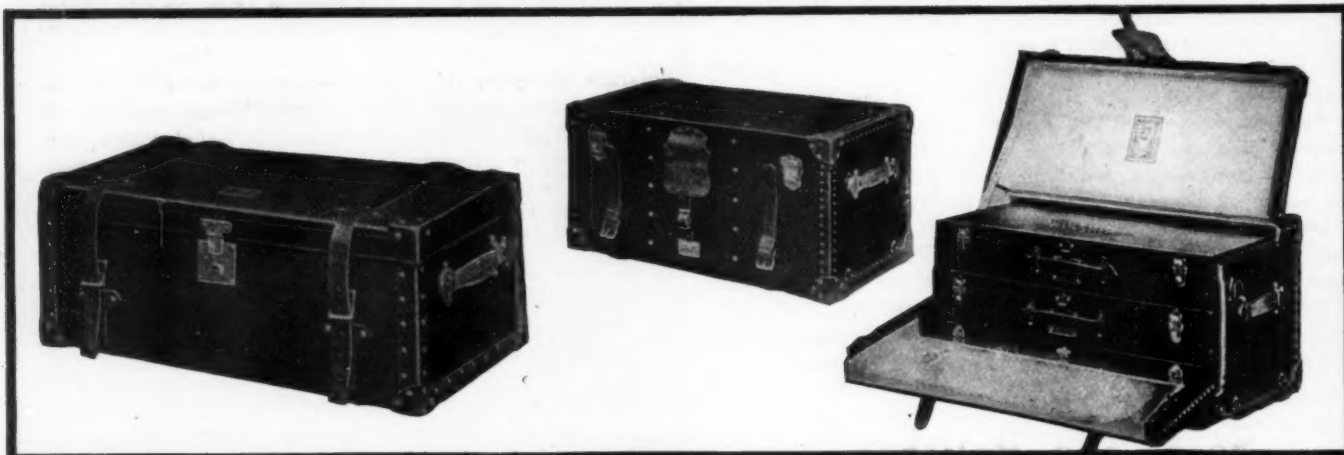
Hall-Thompson Company, Hartford, Conn.—A very extensive line of automobile cleaning specialties is being produced under the name of Wonder Worker by this firm. Metal polishes, hand soaps, automobile body polishes, glass-cleaners, top-dressings and stain removers are numbered among its products. The top-dressing compound is for use on tops which show signs of wear, and it is made with the idea of brightening the top, preserving it and rendering it waterproof.

T. R. Shannon, Hartford, Conn.—This manufacturer makes the Rapid cleaner and polish. It is made with olive oil as a base, and, for this reason, dries quickly. Its principal uses are for the cleaning and polishing of varnish, enamel and leather. For renewing the polished appearance of varnish, the polish is intended to be applied directly over mud, dust or grease without scratching the finish.

R. M. Holingshead Company, Camden, N. J.—Among the specialties made by this company is Nuglos, which, as its name implies, is claimed to give a new gloss to articles of brass and to varnished surfaces. Another product is Whizoil soap, prepared especially for use on automobile bodies. This soap is intended to act as a solvent for dirt, loosening it so that it may be washed off with a sponge.



Davies comfort wheel, a California invention



Combination suit case trunks for the convenience of automobile travelers

Comfort for the Traveler

Some Conveniences for Automobilists Noticed at Boston's Show

SINCE the time for spring and summer touring is almost at hand, many motorists are beginning to think of what equipments they will carry in the way of automobile trunks and other special baggage. The makers of this class of goods have brought out many new articles for touring convenience, and they have sought to further improve those articles which have been on the market for several years.

Automobile trunks for carrying two or three suit cases have been very popular in the past. These can be bought anywhere from \$10 to \$60, depending on their general makeup, the quality of the leather used and the size. For the minimum amount mentioned, a very good trunk with a steel frame and bound with black vulcanized fiber may be obtained. This resembles a suitcase to some extent, and there are two heavy straps for attachment to the car. It is made over a trunk-board body which is covered with waterproof canvas.

Another type of trunk which is made to accommodate two suit cases is shown by one manufacturer for \$18. This is also made over a wooden body, covered with black enameled duck with vulcanized hard fiber binding and there are two side handles. Protection for the corners is afforded by means of the brass corner protection pieces, which are common to all types of baggage. Within, the case is cloth lined, and the flaps are so constructed as to exclude all dust. The inner cases are of black leather. The trunk is 28 inches in length, and it has a width and height of 15 inches, making it possible to carry it very conveniently on the running board, or, better still, on a rack in the rear.

One of the handsomest of these articles sells for about \$65 and it is made of harness leather in black. There is room for three special suitcases which are included in the price. The inside is very nicely finished, and it is doubtful if even the most fastidious would demand anything more perfect than this for the purpose. Such a trunk can be made to retain a rich and handsome appearance, since the leather is easily cleaned just as harness is brightened up.

For several seasons circular tire trunks have been familiar, although their inside construction can be modified to suit any class of articles which the purchaser wishes to carry. These trunks cost anywhere from \$7 to \$25. One handy-looking thing is the hat-trunk which has strips of elastic fabric fastened within the circular frame for holding the hats in position. The manufacturer charges \$18 for this article.

The round metal tire-trunk is a patented article which has

not been out for more than a season. It is made of pressed steel, and the tire is incased as well as the circular leather trunk for wearing apparel. The trunk is provided with a strong lock which makes it impossible for a thief to steal the tire or tires which are carried, and, moreover, it is waterproof and protects from the hot rays of the sun, all three of which points are worthy of consideration where tires are concerned. The tires need not be covered. The case is made in two halves which are hinged at the bottom, and at either side they are fastened together with latches. A lock at the top protects against interference. The metal trunk sells for \$25 at the supply houses.

Lunch baskets and boxes which have very complete sets of dishes, knives, forks, spoons and space for the carrying of the eatables are sold. Some are wicker baskets, while others are made of leather in the form of cases. The prices on these vary widely, of course, depending on the number of persons which the kit will provide for, the completeness and so on. A lunch-trunk for which the dealer asks you \$35 is made to strap on the running board of the car, and it measures 20 inches in length by 10 inches wide and deep. This particular trunk is designed to be carried at all times on the tour, and to have a stock of eatables at all times in the space at one end. The manufacturer adds facetiously that the advantage of this stock soon becomes apparent in case of a bad tire accident at an inopportune time of day. In other parts of this particularly attractive trunk there are three thermos bottles, each of 1-pint capacity, six plates, knives, forks, spoons, cups and napkins. But wait! Further examination reveals a table cloth, corkscrew, can-opener and bottle-opener! What more could be asked of a mere lunch-trunk?

Lunch Carrier and Table Combined

A lunch-box of unique design is that known as the Baldwin lunch carrier. This comes fitted for two, four, six or eight people, and it has every conceivable article for the luncheon table. At each corner of the two halves of the case is a table leg which folds within the case. These, when pulled out, form the legs of a very convenient lunch table, the backs of the two halves forming the top of the table. This sells for from \$40 to \$55, depending on the number of persons which it will serve.

Large leather pockets for the tonneau for fastening to the back of the front seat, and which have an almost unbelievable number of recesses for the storage of magazines, gloves, veils or other articles, which the occupants wish to get at easily, are made by the automobile baggage man. These are in all colors to match the leather of the car, and straps at the top make it possible to attach them to the robe-rails. They cost from \$18 to \$26.

Another article which should not be forgotten by the touring party is the emergency medicine case, many styles and varieties of which are on the market. Sometimes it is filled with little

bottles for the more common medicines, and there are usually places for such things as absorbent cotton, adhesive tape, bandage, special scissors and the like. Almost any price up to about \$35 may be paid for a case of this kind.

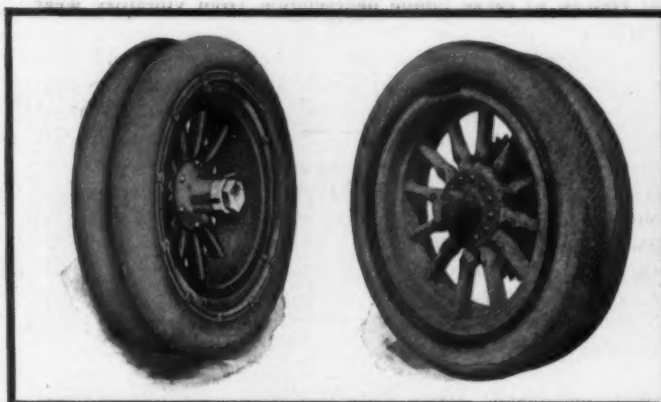
The ladies' automobile bag is among the newer things for the feminine members of the party. This is designed for use on trips which are to last, perhaps, only for the day and on which stops are made at country inns. It looks very much like the handbag which is carried when on a shopping expedition, but there are pockets in which a comb, brush, and other toilet articles are carried—not forgetting the indispensable mirror that is so common.

The side-curtain trunk has just made its debut. It costs you about \$10 and rests on the floor of the tonneau, making it unnecessary to get out of the car to put on side curtains in the rain. The top of this trunk is made on a slant and it is covered with a corrugated material, so that the feet may be rested on it very comfortably. While it is primarily designed as a curtain-trunk, other articles may, of course, be carried in it equally well, the lining inside being of cloth.

Road Test of Military Trucks Delayed

WASHINGTON, D. C., March 2—The practical road test of motor trucks, which is being conducted from this city to Fort Benjamin Harrison, Ind., under the observations of Capt. Alexander E. Williams, is not progressing as rapidly as was expected by that officer. Capt. Williams anticipated that he would accomplish his 1,300-mile run with four trucks in about three weeks, which would enable him to reach his destination about this time; instead of which he was at last accounts received by the War Department, at Greensboro, N. C., having encountered frozen roads in Virginia and sticky mud roads in North Carolina. In many places the wheels sank in the mud to the axles. One of the four machines with which Captain Williams started has been returned to the factory for repairs. The White, four-wheel drive and Autocar are the survivors to date. On one day Capt. Williams and his fleet made a trip of 96 miles, this being between Richmond and Roanoke Rapids, N. C., the next day he made 62 miles. This is considered an excellent showing with loaded trucks. It is expected the trip will be less difficult beyond Atlanta, but it looks as if the test would be prolonged to six weeks.

HARRISBURG, PA., March 2—The automobile division of the state highway department has issued up to date 25,285 licenses to owners of motor cars, 2,316 dealers' licenses and 9,306 drivers' licenses. This is far ahead of any previous record at this time of the year and if the demand keeps up it is estimated that at least \$75,000 worth of licenses will be issued this month.



Fisk and Michelin types of twin pneumatic tires

Dual Pneumatic Equipment

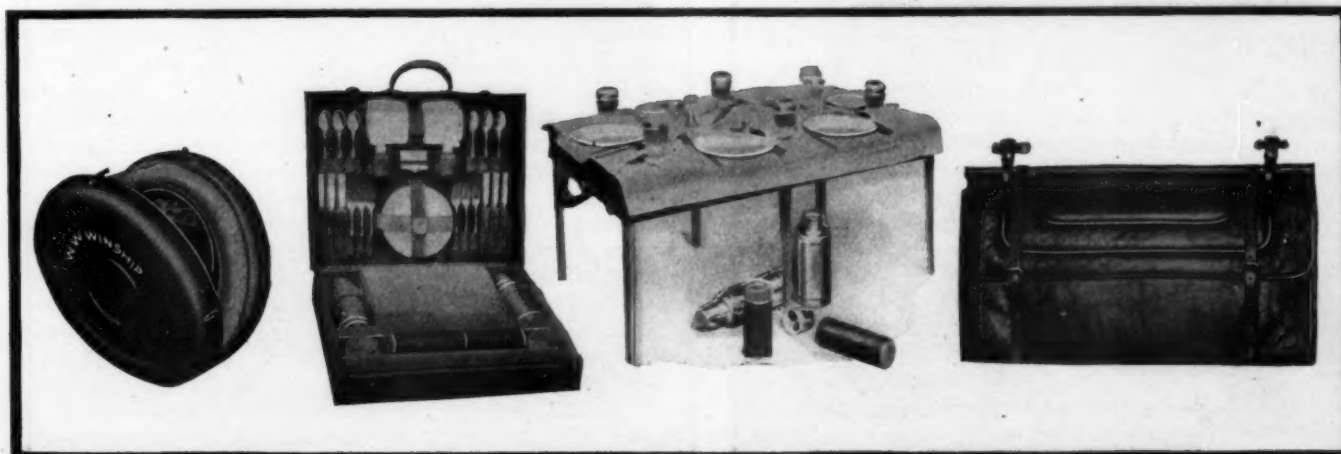
Speed and Ability to Carry Loads Gained by Twin Tires

NO single standard pneumatic tire of any size is made which will withstand the load which two tires of small size will carry when mounted dually on the same rim. For this reason the use of dual pneumatic equipment has been adopted for heavy touring car service, for fast express service over ordinary city streets whose pavements are comparatively rough and for fire vehicle service.

The keynote of the whole matter is speed. It has been found that, for commercial cars in particular, the attaining of even normal speeds with cars equipped with solid tires causes a vibration of every part which tends to wear out the machines long before their time. For fast delivery service, this great wear and tear due to vibration becomes very great and some means had to be devised to lower the consequent high rate of depreciation.

To carry heavy loads on single pneumatics would mean the making of tires which would be too large and too cumbersome for practical service. It is for this reason that the use of two or more tires of ordinary stock size mounted on the same rim has been resorted to.

For slow speed trucks, which are built for carrying loads of 5 to 10 tons, this equipment is not recommended, the twin solid being better for such service, since these machines are very heavily designed in the first place, enough pneumatics could not be used to stand the strain, and the speed of such trucks is not



Winship metal tire trunk

Baldwin lunch carrier which is also a folding table

Winship leather pouch

great enough to cause undue depreciation from vibratory wear and tear.

On fast delivery trucks and other speedier vehicles of from 2 to 2 1-2 tons dual pneumatics have proven extremely successful, giving good tire mileage, increasing the daily amount of work which each truck can do and greatly reducing the cost of maintenance by protecting the mechanism from road jars.

The fast delivery trucks in the service of the *New York Herald*, which are equipped with dual pneumatics, run from 8,000 to 10,000 miles on one set.

For a given carrying capacity, the use of dual pneumatics allows the truck manufacturer to materially decrease the weight of his product, since it does not have to be made extra heavy to withstand great road jarring.

In a word, twin tires more than double the carrying capacity of single pneumatics, retain their easy-riding qualities and last about five times as long under the same conditions of operation. The cost, while greater at first, is therefore really materially lessened in the long run by their use.

The tires themselves are the same in either case, the rim and wheel being the only parts necessary to change in the adoption of dual equipment.

Should one of the dual tires become deflated through puncture or blowout, the equipment makes it possible to get to the repair shop or garage on the other tire, thus saving the rim. Of course, the weight of the double rim and two tires is considerably greater than that of the single equipment, but this is of very little moment since the weight of the wheels and tires is on the ground in either case, and the added amount does not have to be borne by the car itself. There is a little more inertia in starting the heavier wheels, but after the vehicle is under way there is no increase in the power required for propulsion.

Cars which are equipped with single tires may have their rims rebuilt for duals at a cost of from \$200 to \$250, depending on the size. This includes the equipping of the front wheels as well with the same type of demountable rims, so that any particular tire will fit any one of the wheels. This is an important point in the use of dual equipment.

Figures furnished by the Michelin Tire Company show that their duals will support a normal weight of 4,000 to 5,000 pounds per axle normally, while their single pneumatics of largest size will not support more than 2,700 pounds per axle.

According to this company, which is the pioneer dual pneumatic maker, the inflation of twin tires should be in proportion to the load per axle. Twin tires need not be inflated to as high a pressure as singles, and ordinarily an inflation pressure of from 50 to 56 pounds is sufficient. This, however, is the very least pressure which should be carried. Each tire should, of course, be inflated to the same pressure as its fellows, so that each will carry its proper proportion of the total load.

A table showing the sizes of tires to use in dual constructions for various loads follows:

Total load on axle.	Tire size.
2,700 to 3,500 pounds	4 inches
3,500 to 4,400 pounds	4 1-2 inches
4,400 to 5,200 pounds	5 inches

In arriving at the proper size of tire to use, the car should be weighed when fully loaded. If it weighs 4,500 pounds, then the rear axle will carry about 2,700 pounds, assuming that it takes 60 per cent. of the load. The tire to use in this case would be the 4-inch one. No other size would be as economical, everything considered.

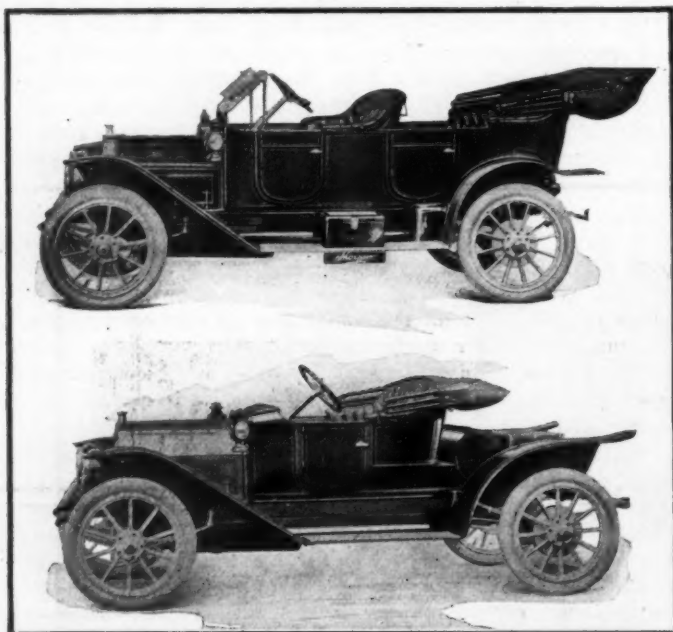
Among the makers who are putting out dual equipments are the Michelin, Fisk, Firestone and the United Rim concerns.

Boston Shows Cars Not Seen at New York or Chicago

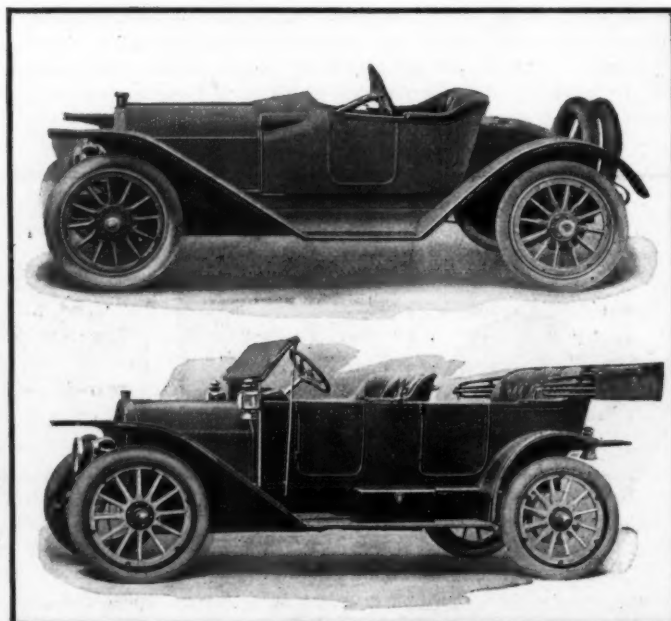
TWO chassis types are brought out this year by the Berkshire company. These are the six-cylinder and the four-cylinder models, both of which have motors of the same cylinder dimensions, 4 11-16 by 5 1-2 inches. The cylinders in each case are cast separately.

In the four-cylinder model, the cooling is aided by a gear-driven centrifugal pump and a honeycomb radiator. The clutch

runs in oil and is of the multiple-disk type. The oil is carried to all motor bearings by means of positive force-feed. There are three forward speeds, and the drive is by shaft through two universal joints. The rear axle is floating and the wheel sizes are 36 by 4 and 36 by 4 1-2 inches. Semi-elliptic front and three-quarter elliptic rear springs are included. The wheelbase is 124 inches.



The Moyer 1912 touring car and roadster



Roadster and touring types of the Lenox



Field wagon built by Alden Sampson Company now undergoing Government service test in Texas

For the six-cylinder model, the specifications are the same with the exceptions of the use of four forward speeds instead of three, a wheelbase of 134 inches, wheel sizes of 36 by 4 1-2 and 37 by 5 inches and a gear ratio of 2 3-4 to 1 instead of 3 to 1.

Either of these cars may be purchased in any body style, and their equipment includes top, windshield, speedometer, demountable rims and self-starter.

Although the Lenox Motor Car Company is contemplating the addition of a six-cylinder model to the four-cylinder type which it is now marketing, no specifications as to this new model are forthcoming as yet.

The four-cylinder car has a 35-horsepower Excelsior motor, the cylinders being 4 1-8 by 5 1-4 inches and cast in pairs. The carburetor is of the double-jet, water-jacketed type, and ignition is by a dual system. Lubrication is by force-feed through the crankshaft. The gearset has three selective speeds, the gearbox which is of Stutz design, being located on the rear axle. The clutch is a leather-faced cone, the rear axle is of the semi-floating type and the brakes are both internal expanding on the rear wheels. Tires are of the quick detachable demountable rim type, size 34 by 4 inches. The wheelbase is 116 inches.

Seven body types are fitted to this chassis. The equipment includes top and side curtains, windshield, speedometer, Gray & Davis head, side and tail lamps, etc. For a nominal extra charge, electric lighting and self-starter are included.

The Moyer cars, which are a Syracuse, N. Y., product, are made in six-cylinder and four-cylinder types. The dimensions of the six-cylinder engine are 4 by 5 inches, the cylinders being cast in threes. The horsepower is 45, the wheelbase 122 inches and the speeds forward three. For the four-cylinder model, the engine develops 30 horsepower, the bore is 4 1-2 and the stroke 5 inches and the cylinders are cast in pairs. The wheelbase is 116 inches.

In both models the cooling is positive by means of gear-driven centrifugal pumps; Mea magnetos furnish the ignition current; the motors are oiled positively through pumps; cone clutches with eleven steel springs under the front edges of their leather facings are used and the rear axles are semi-floating. The front springs are semi-elliptic, while the rear ones are three-quarter elliptic.

These cars are furnished in a variety of body types, and their equipments include tops, dust-hoods, windshields, speedometers, acetylene tanks, horns, lamps and the regular outfit of tools furnished with most cars.

New Sampson Field Wagon

Now Undergoing a Severe Service Test in Texas by the Government

THE latest type of field wagon for the United States Army, built by the Alden Sampson Manufacturing Company, a division of the United States Motor Company, has been delivered to the Quartermaster's Department and placed under a severe test in Texas to determine the efficiency of motor wagons for field service, such as the carrying of supplies, and troops when necessary, across country.

The wheels of the Sampson field wagon are 42 inches in diameter both front and rear, this size being necessary to give the clearance which is required by the army in cross-country work.

The seat is built over the engine in the manner characteristic of the standard 3,000-pound Sampson. The inside body dimensions are 9 feet long by 43 inches wide. It is equipped with flare-boards on the sides and a tail-gate which runs up to the same height of the side-boards. These are heavily reinforced with iron and chained. Conforming with army practice the body is fitted with removable bows and a canvas covering.

Nine miles an hour is the very highest speed the wagon will make. The normal engine speed is 1,000 revolutions per minute and the engine is restricted by a governor to this speed. Also an especially low gearing has been adopted.

Another feature which suggests that a wide range of service is anticipated by the army officials is the specification of a 60-inch tread which allows the wheels to "track" in the very wide ruts of Southern roads. This has been the tread of all horse-drawn field equipment. The wheelbase is 110 inches, and the wagon is designed to carry from 2,500 to 3,000 pounds.

The engine is of the four-cylinder type, having a bore and stroke of 4 and 5 inches respectively. It is mounted in a pressed-steel frame 4 1-2 inches deep, the flanges being tapered from 4 inches wide in the center to 2 inches wide at the ends. The front axle is a standard forged I-beam section steel axle, while the rear is 2 1-2 inches square.

Multiple disk clutch, three-speed transmission, and double set of brakes, both expanding internally and partially self-wrapping in either direction, are features not foreign to present tendency in motor wagon design.



How the Thomas Motor Company, of New York, stores its surplus bodies

STORING Surplus Bodies—The Thomas Motor Company, Broadway and Sixty-fourth street, New York City, has a simple, effective method of storing surplus bodies. It consists of parallel beams swung from the ceiling by means of block and tackle on which the bodies can be easily lowered for inspection or raised out of the way when not required.

Bartlett to Sell Ford—O. L. Bartlett, Peebles, O., has taken the agency for the Ford.

Schott to Sell Courier—S. W. Schott, Westerville, O., has taken the Central Ohio agency for the Courier.

Ford Agency in Mowreystown—Miller & Souners, Mowreystown, O., have taken the local agency for the Ford cars.

Rambler in Akron—The Portage Motor Car Company, 35 South College street, Akron, O., has taken the agency for the Rambler.

Adamson Has Briggs—The Adamson Auto Company, 35 West Mound street, Columbus, O., has taken the Central Ohio agency for the Briggs-Detroit.

Westcott Southwestern Branch—The Westcott Motor Car Company, Richmond, Ind., has opened a Southwestern branch at 413 Main street, Little Rock, Ark.

New Columbus Salesmen—Leighton & Hancock, agents for the Sternberg motor truck in Columbus, O., will open a new salesroom at 39 East Town street.

Columbus Removal—The Sawyer Auto Specialty Company, Columbus, O., has removed its plant from East Spring street to larger quarters at 43-49 Lafayette street.

Lion Sales Agency—The Brewer Auto Sales Company has been formed to take the Central Ohio agency for the Lion. The salesroom is at 28-30 West Spruce street, Columbus, O.

U. S. Takes Rauch & Lang—The United States Carriage Company, South Fourth street, Columbus, Ohio, has taken the Central Ohio agency for the Rauch & Lang electric cars.

Harris and Llewellyn in Charge—B. B. Harris and R.

W. Llewellyn have been placed in charge of the Republic Tire & Rubber Company, 215 North Fourth street, Columbus, O.

Opens Store—The Rogers Supply & Tire Company, a corporation recently formed to deal in a full line of tires and accessories, has opened a store at 48 East Long street, Columbus, O.

Piedmont Company Opens—The Piedmont Motor Car Company, Charlotte, N. C., has opened its garage and salesroom at 211 South Church street. The company handles Stoddard-Dayton, Lozier and White cars and Rauch & Lang electrics.

Transfer Company to Enlarge—The board of directors of the Columbus Transfer Company, of Columbus, O., has decided to increase its motor vehicle equipment to a large degree both in the taxicab department and the motor truck department.

Upp & Son Agents Now—J. E. Upp & Son have closed out their automobile repair business at Greenfield, O., and in the future will only act as sales agents for the Cadillac. The headquarters of the concern will be at the Greenfield Auto Company.

Smith Buys Early—Harry E. Smith has purchased the stock of the Early Motor Car Company, of Columbus, O., which went into the hands of a receiver recently, and will continue the business.

Tire Company Changes Name—The Lee Tire & Rubber Company, Conshohocken, Pa., has taken over the Arrow Tire Company, William Penn P. O., Pa., and has changed the name of the Arrow company to the Leeland Tire Company, Conshohocken, Pa., and the name of the product of this company, formerly Arrow tires, to Leeland tires.

Building in Detroit—Edwin S. George, Detroit, Mich., is fast developing his vacant property which has Woodward avenue frontage. The foundations are already laid for a new row of stores on the west side of Woodward avenue between Willis and Canfield avenues. One of these will be occupied when completed about April 1 by the Barber Motor Sales Company, Michigan distributor for the Detroit.

Lion in Montreal—The Royal Automobile Company, Montreal, Que., has taken the agency for the Lion car in that city and vicinity.

Lair Takes Michigan—Paul Lair has been appointed Montreal, Que., representative of the Michigan car in that city and surrounding territory.

Garage in Business—The East Palestine Garage, East Palestine, O., has been opened. John Thatcher will look after the mechanical department.

Press Banquet Given—The A. Elliott Ranney Company, New York City, recently entertained the automobile editors and writers at a banquet at Healy's.

Success of Ottawa Show—So great was the success of the recent automobile show that next year's exhibition is assured, with half the space already sold.

Steenrod to Open Garage—The Steenrod Auto Supply Company, Wheeling, W. Va., will soon open a four-story fireproof garage at 2106 Main street in that city.

Montreal Regal Company—The Regal Auto Corporation, of Montreal, Que., has been formed to handle Regal cars in that city. Showrooms have been opened at 10 St. Lawrence boulevard.

To Conduct Garage—The Carolina Motor Company has been organized and will conduct a garage in Orangeburg, S. C. The members of the firm are C. A. Stroman, J. M. Ziegler and N. T. Ziegler.

Chabot to Open Salesroom—Charles J. Chabot, distributor of Metz cars and San Antonio, Tex., agent for the Abbott-Detroit and Matheson, is to open a display and salesroom adjoining the Alamo.

Another Member—The Auto Parts Manufacturing Company, Jersey City, N. J., has been elected a member of the Automobile Credit Association, which has offices at 80 Wall street, New York City.

Canadian Six Made—The Tudhope six is the first six-cylinder car to be made in Canada. It is manufactured by the Tudhope Motor Car Company, Orillia, Ont. This company makes the Everitt in Canada.

Vancouver Company Organized—The Archibald Auto Company, Ltd., has been organized to carry on a general automobile business in Vancouver, B. C. A new fireproof garage has been built on Alberni street.

C. N. A. A. Incorporated—The Canadian National Auto-

mobile Association has been incorporated at Toronto, Ont., for promoting automobiling and for correcting unreasonable legislation, advocating good roads, etc.

Orr Sells Out—E. Burton Orr, Dwight, Ill., has sold out his garage and sales interests to J. E. Ferguson, who recently organized the Ferguson Auto Sales Company. The new concern will handle the Parry, E-M-F and Flanders.

Jennings Opens Salesroom—R. S. Jennings, New London, Wis., has opened a salesroom for the Cadillac and Studebaker lines in Waupaca county as territory, and will erect a large fireproof garage and salesroom in the spring.

Diamond Company officers—The officers of the newly formed Diamond-Arrow Car Company, Ottawa, Ont., are: T. C. Bate, president; E. McMahon, secretary; T. Fleming, managing director; L. G. Fainney, mechanical superintendent, and Nelson Kerr, sales agent.

Ottawa Wants Sprinkler—City Engineer Kerr, of Ottawa, Ont., is getting prices on an automobile street sprinkler and is in favor of the city securing one as a test. If it should prove satisfactory he would recommend a motor truck for garbage collection as well as additional sprinklers.

Luncheon to Writers—During the recent automobile show at Baltimore, Md., the International Motor Company entertained the automobile writers of the Baltimore newspapers, as well as the visiting writers and advertising representatives of the leading trade magazines, at a luncheon at the Emerson Hotel.

New York Stops Joy-Riding in City Cars—Every city official who uses an automobile owned by the City of New York without the words City of New York painted on the body of the car in 5-inch letters will be liable to a fine of \$10 for each offense according to an ordinance recently put into effect by the aldermen.

New Ottawa Garage—John and William Wylie, Ottawa, Ont., are to erect in that city a three-story garage for 125 automobiles and costing \$75,000. The building will have a frontage of 165 feet and a depth of 157 feet. The foundations will provide for the subsequent addition of eight or nine stories. The garage will be ready about June or July.

Briggs in New Factory—The Briggs-Detroit Company, Detroit, Mich., is now established in its new plant which has a floor space of 25,000 square feet and will permit of the construction of over 1,000 cars yearly. Excavations and foundations for another building of the same size have been made though the structure will not be finished at once.



New plant recently occupied by the Briggs-Detroit Company in Detroit



Reo which made clean sweep at recent Fresno, Cal., meet

Young Takes Marmon—T. A. Young, Syracuse, N. Y., has secured the local agency for the Marmon car.

New E-M-F Agency—An E-M-F agency has been opened in Lake Charles, La. J. W. Price is in charge.

To Sell Seitz and Lincoln—Norwood Brothers, Inc., have the Baltimore, Md., agency for the Seitz and Lincoln cars.

Pope Takes Simplex—The Simplex car is again in the field in Baltimore, Md., with G. A. Pope, Jr., as representative.

Move to Milwaukee—Legnard Brothers have moved their general offices from Chicago and Waukegan, Ill., to Milwaukee, Wis.

Franklin in Plainview—The Scott Automobile Company, Plainview, Neb., has contracted to sell Franklin automobiles in this territory.

Shawmut in New Orleans—Shawmut tires will be handled in New Orleans, La., for the first time through a local agent, William E. Colt.

Rent Cumberland Garage—Peter Steineck, Jr., and Leroy Tuttle have rented the Cole garage, Cumberland, Wis., and will reopen it at once.

Buick in Lake Mills—The Lake Mills Automobile Company, recently organized at Lake Mills, Wis., has been appointed agent for the Buick.

Has Added the Stoddard-Dayton—The United Motors Des Moines Company, Des Moines, Ia., has added the Stoddard-Dayton to its line.

Rogers Takes Ford—F. J. Rogers has taken the agency for the Ford and opened a garage in Crandon, Wis. It will be managed by Leslie Carter.

Fond du Lac Wants Show—Dealers in Fond du Lac, Wis., are organizing an association to promote a local show in the Coliseum after March 15.

L. S. in Providence—The Whitten Motor Vehicle Company, Providence, R. I., has just taken the agency for the Lippard-Stewart delivery cars.

Handling Columbia and Maxwell—The Columbia and Maxwell cars are being sold in Baltimore, Md., and vicinity by the L. M. Vordemberge Motor Company.

Automobiles in Iowa—According to figures recently issued by the Iowa Secretary of State the number of automobile dealers in Iowa at the present time is 1,800.

Take Lippard-Stewart—Neely & Ensor, Baltimore, Md., have taken the agency for the Lippard-Stewart delivery car. They also handle the Alco truck and touring car.

Schwartz & Company Get Ajax—Joseph Schwartz & Company, New Orleans, La., have been named as distributors for Ajax tires in Louisiana and southern Mississippi.

New Hose-Wagon—The new automobile hose-wagon

ordered recently by Meridian, Miss., from the Seagrave Manufacturing Company has been placed in commission.

Portland Has New Truck Agency—The Michigan Motor Company, Portland, Ore., has just taken the agency for Lippard-Stewart delivery cars for the state of Oregon.

New Bridgeport Agency—Lippard-Stewart delivery cars are now being handled in Bridgeport, Conn., by the Edwin Jennings Company, which handles the Stevens-Duryea.

Opens Showroom—The Selden-Maxwell Auto Company, 910 Frederick avenue, St. Joseph, Mo., has opened a salesroom for handling Selden and Maxwell cars and Sampson trucks.

American in New Quarters—The American car now occupies the quarters vacated by the Gomery-Schwartz Motor Car Company, Philadelphia agents of the Hudson, Broad and Callowhill streets.

Hendrick Gets Quarters—David S. Hendrick, Washington, D. C., agent for the Thomas and Franklin, whose establishment was gutted by fire, has secured temporary quarters at 1319 H street, N. W.

Goodyear's Kansas City Branch—The Goodyear Tire & Rubber Company has established a factory branch in Kansas City, Mo., at 1417-19 McGee street. Edward E. Flippen, Jr., is the local manager.

To Occupy New Quarters—The Auto Equipment Company, Philadelphia, is about to occupy new quarters at Eighteenth and Market streets. In connection with the new store will be a service station and a garage.

Union Company Established—The newly-organized Union Motor Car Company, Philadelphia, has established headquarters at Broad and Wallace streets to distribute the Lion in eastern Pennsylvania and Delaware.

Westcott in Minnesota—T. M. Anderson, Peerless agency, has taken the Minneapolis, Minn., district for the Westcott car. The Roller Motor Car Company has taken the agency for five counties near St. Paul, Minn.

Branch Garage Opened—J. A. Bruett, garage owner at Sheboygan, Wis., has opened a branch at Elkhart Lake, Wis., under the management of H. Bruett. The Page and Warren agencies will be held by both garages.

Building to House Shows—James Cunningham Sons & Company, Chicago, Ill., have purchased land at 2341-43 Michigan boulevard and contracts have been let for a \$100,000 building which is to be utilized for motor car displays.

Statz Buys Garage—Frank Statz, Madison, Wis., has purchased control of Pregler's Garage and has secured the agency for the Cadillac, Stoddard-Dayton, E-M-F and Flanders and the Crown trucks, together with the Flanders light delivery wagon.

New Havers Agents—Among the agencies just appointed by the Havers Motor Car Company, of Port Huron, Mich., to handle the Havers six are: William H. Baxter, Springfield, Mass.; Bender Motor Company, Paterson, N. J.; A. S. French Auto Company, Vancouver, B. C.

Jules Changes Hands—The Jules Motor Company, of Guelph, Ont., has passed into the hands of a group of Toronto capitalists, whose names are not yet available for publication. It is understood, however, that George H. Gooderham, M. P. P., is to be president of the new company.

Shreveport Wants Engine—Splendid results are being obtained from the automobile hose trucks which were recently purchased for the Shreveport, La., fire department. Due to the good showing made by the hose trucks the city is now considering the purchase of an automobile engine.

Syracuse Club Dines—There were 400 guests, or nearly half the membership of the Automobile Club of Syracuse, N. Y., in attendance at the annual dinner of the organization at the Onondaga Thursday night, the most successful in the club's history. The toastmaster was Alexander D. Jenney.

Hupp-Yeats in Des Moines—The Scars Auto Company, Des Moines, Ia., has added the Hupp-Yeats car to its line.

New Woods Agency—The McArthur-Zollars-Thompson Company has taken the Minneapolis, Minn., agency for the Woods electric.

New Orleans Fire Patrol—A specially constructed Knox truck has been put in commission in New Orleans, La., by the fire insurance patrol.

New Ambulance in Commission—An improved motor ambulance soon is to be placed in commission in New Orleans, La., by the Charity Hospital.

Martin Branch Manager—George M. Martin has been appointed manager of the branch which the Firestone Tire & Rubber Company has opened in Minneapolis.

United Garage Expands—The United Garage Company Toledo, O., has leased the building on Jefferson avenue adjoining its present garage and will double its present capacity for housing cars.

Form Sales Company—Albert H. Lohrman and his brother, John F. Lohrman, have formed a company, to be called the Cole Motor Sales Company, to distribute the Cole in Cincinnati, O., and surrounding territory.

King Has New Agents—The King Motor Car Company, Detroit, Mich., has appointed the following new agents: Iverson & Johnson, Kiron, Ia.; the Wasson Company, Lincoln, Ill., and Joseph E. Landry, New Bedford, Mass.

Increases Capital Stock—The Milwaukee Tire & Supply Company, 457 Milwaukee street, Milwaukee, Wis., distributing Republic tires, has increased its capital stock from \$12,000 to \$20,000 to provide for extensions of the business.

Now a Factory Branch—The Baker Motor Vehicle Co., of Cleveland, O., have taken over the interests of the Clark Motor Company, the Kansas City, Mo., dealers for Baker electrics, and will conduct a factory branch. J. A. Pray is in charge of the branch.

Electrical League Formed—Milwaukee, Wis., men engaged in all phases of the electrical business have organized the Milwaukee Electrical League. F. A. Vaughan is president and L. L. Tatum is secretary. Monthly dinners will be held. Automobile ignition and illumination will be given much attention.

Regular Factory—A service depot, which will permit of the duplication of any part of the Ford car, is being stocked at the New Orleans branch of the Ford Motor Company. The selling agency has practically become a factory, as nearly any part of the car can be duplicated without going out of the building.

Chauffeurs Organize—The Professional Chauffeurs' Association, Syracuse, N. Y., will incorporate under the name of the Professional Chauffeurs' Association of Onondaga. An employment bureau has been opened at the clubrooms. The membership is now 75. The association is working with the Automobile Club for the suppression of the speeding evil.

Taxi Company in York—A new automobile business venture in York, Pa., known as the York Taxi Company, will shortly take over the several cab companies in this city and begin business about April 1. The company was organized in this city this week with a capital of \$15,000 and will begin work with at least five taxicabs and one truck, the latter of which is designed for hauling baggage.

Only Bulb Horns for Montreal—The Private Bills Committee of the Legislative assembly, Quebec, Que., has accepted the clause of the Montreal city bill giving the city the right to prohibit the use of sirens and other distinctive automobile alarms on the streets and reserving the employment of such devices to police, fire, ambulance and light and power companies' vehicles.

Ambulance in Washington—The first motor ambulance in Washington, D. C., will be put into service May 1. Emerson & Orme, who handle the Detroit electric in the national capital,



New Alco Berline showing ventilating scheme in roof

have closed a contract with the trustees of the Emergency Hospital for a specially-built Detroit electric ambulance which will be equipped with Edison batteries and will be capable of making a speed of 18 miles an hour.

Cole Appoints Agents—New Cole agencies have been established by the Henderson Motor Sales Company, Indianapolis, Ind., as follows: Cole Motor Sales Company, Peebles Corner, Cincinnati, O.; William E. Bell, Little Rock, Ark.; Mt. Lebanon Auto & Repair Company, Mt. Lebanon, Pa.; R. B. Pierpont, North Haven, Conn.; Theodore Williams, Canal Dover, O.; Crescent Garage Company, Ogdensburg, N. Y.; J. H. Brown, Eveleth, Minn.; C. E. Sullivan, Oregon City, Ore.

Many Cars for Mexico—Exceptionally numerous shipments of motor cars passed through New Orleans, La., during February, according to the report of the dock commission. The greatest number of cars were consigned to Mexico City, 112 cars being billed from different points in the United States to the southern republic. Porto Rico was the destination of 84 cars. Guatemala was the recipient of 14 cars, which were routed through this port. Other countries in Central America received several cars.

Milwaukee to Have Clean Streets—The City street department of Milwaukee, Wis., has purchased four street-flushing machines, making a battery of eight machines which will keep the asphalt-paved streets of the city clean during the summer. The department has purchased 700,000 gallons of asphaltum oil for macadam road preservation and dust-prevention, as compared with 500,000 gallons used in 1911. It has been found that it will be unnecessary to treat the streets oiled last year until the spring of 1913.

Columbus Displaces Horses—The fire department of Columbus, O., has decided to do away with horses and use motor cars in hauling its fire equipment in the future. The first step towards this change was the appropriation of \$50,000 for the purchase of motor cars with which to haul the steamers and hook and ladder trucks which are now in use. The new equipment will be assigned to the central part of the city and the work of substituting motor-driven equipment for the horse-drawn equipment will continue until all of the horses are displaced.

U. S. Tire Company Changes—T. R. Burton, manager of the Pittsburgh branch of the United States Tire Company, has been appointed assistant to O. S. Tweedy, Eastern district manager of this concern. Mr. Burton will move to New York. His successor in Pittsburgh will be C. C. Gehring, who during the past year has been connected with the United States Tire Company's Philadelphia branch. J. C. Weston, Western district manager, has moved from San Francisco to Chicago to take charge of the Central District and C. A. Gilbert has gone from New York to San Francisco to take Mr. Weston's place.

Move in Topeka—Stahl & Stone, Cole agents at Topeka, Kan., have moved into new quarters at 621 Quincy street.

Armington Change—R. L. Kampf has become the successor to Kampf & Markland, Cole representatives in Armington, Ill.

Linsley Sales Manager—C. A. Linsley has been made sales manager of the Portland, Ore., branch of the E-M-F-Studebaker Corporation.

Change in Location—The New York Sales Company, Cole agent at Binghamton, N. Y., has moved into new quarters at 25 Washington street.

Cartercar Agent—The Vance-Canavan Motor Company, of Los Angeles, Cal., has closed an agency with the Libby Garage, of Santa Ana, Cal., for the Cartercar.

Imperial in Buffalo—The Zimmer Motor Vehicle Company, 803 Main street, Buffalo, N. Y., has opened an agency there for the sale of Imperial automobiles.

Remy Service Station—The Remy Electric Company, Anderson, Ind., has established a new service station in Grand Rapids, Mich., with the Lamb Electric Company.

King in Saskatchewan—The Prince Albert Motor Sales Company, Prince Albert, Sask., has taken the agency for the King in Prince Albert and surrounding territory.

Parking on Broad Street—The new traffic regulations are now in force in Philadelphia. Cars are now parked in the center of Broad street instead of along the curbs as heretofore.

Occupy New Quarters—The American Cole Motor Company, Syracuse, N. Y., agent for the Cole and American, has moved into new salesrooms and garage at 215-217 James street.

Goes with Cole—Charles Schuster, for 2 years sales manager of the Cadillac in Cincinnati, O., has resigned to accept a similar position with the Cole Motor Sales Company, Cincinnati.

Hart Now Inter-State—The Hart Motor Car Company, Kansas City, Mo., has changed its name to the Inter-State Motor Car Company, which is now occupying a new salesroom at 1715 McGee Street.

Hughes to Handle Rauch & Lang—F. H. Hughes has been engaged by the Ralph E. Brown Motor Car Company to handle the agency in his office of the Rauch & Lang electric carriages in Buffalo, N. Y.

Hess-Bright Branch—The Hess-Bright Company has opened a new retail branch store at 666 North Broad street, Philadelphia, for the marketing of Hess-Bright ball bearings. Herman P. Schade is in charge.

Cino Agencies—Haberer & Company, Cincinnati, O., have recently placed the following agencies: A. E. Reid, Toledo, O., who covers western Ohio and southern Michigan; and Charles F. Batt, Brooklyn, N. Y., whose territory is Long Island and the suburbs of New York City.

Buys Motor Hurry-Up Wagon—An automobile patrol-

ambulance, costing \$3,400, was purchased by the police board of Niagara Falls for use in that city. The patrol-ambulance will accommodate ten prisoners, and will be delivered within three months to Niagara Falls.

Bus to Crystal Beach—During the summer season automobiles will supplant the omnibus that has been used at Ridgeway, Ont., for transportation to Crystal Beach, a summer resort. The automobile will make twice as many trips as did the omnibus and they will accommodate many more people.

Automobile Incorporations

AUTOMOBILES AND PARTS

BROOKLYN, N. Y.—Fairchild Electric Vehicle Company; capital, \$50,000; to engage in the automobile business. Incorporators: F. K. Fairchild, M. D. Fairchild, A. E. King.

BROOKLYN, N. Y.—Long Island Commercial Car Company; capital, \$9,000 to do a general automobile business. Incorporators: C. F. Lewis, C. I. Crowell, C. A. Moller.

CAMDEN, N. J.—Peerless Roller Bearing & Appliance Company; capital, \$300,000; to manufacture roller bearings, automobiles, motor trucks, etc. Incorporators: P. E. Sharpness, W. K. Kneidler, I. Michner, W. J. Moore, J. R. Jarrett.

FAYETTEVILLE, N. C.—Ramaur Brothers Company; capital, \$25,000; to engage in automobile business. Incorporators: H. Ramaur, A. Ramaur, C. Ramaur.

INDIANAPOLIS, IND.—Empire Automobile Company; capital, \$100,000; to manufacture and sell automobiles. Incorporators: C. E. Gibson, A. Waldheim, D. May, D. Sommers, C. B. Sommers, F. H. Quick.

JERSEY CITY, N. J.—Excelsior Specialty Company; capital, \$30,000; to do a general automobile business. Incorporators: F. Thomassin, F. D. Lockwood, A. Higson, G. H. Martens, C. S. Goodfellow.

LEWISBURG, W. VA.—Greenbrier Motor Company; capital, \$10,000; to engage in the automobile business.

NEW YORK CITY.—Storm Motor Car Company; capital, \$10,000; to manufacture and sell automobiles. Incorporators: J. P. Storm, C. M. Storm and others.

NEW YORK CITY.—Westfield Motor Truck Company; capital, \$150,000; to manufacture and sell automobile trucks. Incorporators: W. F. Magill, G. Osborn, C. A. Forshaw.

PHILIPPI, W. VA.—Philippi Auto & Supply Company; capital, \$10,000; to buy, sell, exchange, rent and keep for sale and for hire automobiles and other vehicles and machines. Incorporators: R. Robinson, H. A. Hundt, W. R. Stalnaker, J. W. Byrer, B. W. Wilson, J. H. Yeager, H. H. Byrer.

GARAGES AND ACCESSORIES

BROOKLYN, N. Y.—Waverly Storage Company; capital, \$10,000; to conduct an auto trucking and storage business. Incorporators: J. F. McGuire, K. McCarthy, A. Sonnenstrahl.

BUFFALO, N. Y.—Dayton Airless Tire Sales Company; capital, \$10,000; to sell automobile tires. Incorporators: J. Schoepflein, J. L. Seligman, A. L. Strateimer.

COLUMBUS, O.—Motor Necessities Company; capital, \$10,000; to manufacture automobile supplies and accessories. Incorporators: L. H. Black, C. T. Gaither, O. G. Dibel, L. A. Manchester, C. A. Manchester.

CONEMAUGH, PA.—Conemaugh Garage & Machine Company; to conduct an automobile garage and machine shop. Incorporators: I. B. Custer, J. W. Helsel and others.

ELKINS, W. VA.—Elkins Automobile Supply Company; capital, \$5,000; to repair automobiles and operate a garage. Incorporators: T. Donahue, G. W. Adamson, E. O. King, E. D. Tauber, W. C. Poston, S. B. Hoffner, S. O. Billings.

HOBOKEN, N. J.—Keller Auto Company; capital, \$100,000; to manufacture machinery and automobiles. Incorporators: C. D. Bland, M. W. Gibbs, H. R. Blackburn.

MONROE, N. Y.—Monroe Garage Company; capital, \$3,000; to conduct an automobile garage. Incorporators: W. S. Jessup, W. F. Griffin, H. S. Jessup.

MONTGOMERY, ALA.—Standard Auto Supply Company; capital, \$25,000; to sell automobile supplies and accessories. Incorporated: J. F. Stephens, W. E. Dark, L. D. Stephens.

NEW YORK CITY.—Packard Pleasure Car Company; capital, \$1,000; to engage in the automobile livery business. Incorporators: L. J. Kennedy, M. Kennedy, E. J. Shelley.

NEW YORK CITY.—Reliance Rubber Company; capital, \$1,000; to manufacture automobile tires. Incorporators: J. B. Baker, S. R. Simpson, J. W. Ebbs.

ORANGEBURG, S. C.—Carolina Motor Company; to conduct an automobile repair shop. Incorporator: C. A. Stroman.

SALEM, N. Y.—Salem Automobile Service Company; capital, \$25,000; to operate automobiles for hire. Incorporators: G. D. Jaquette, A. Lawrence, C. E. Jaquette, W. E. Allen.

SYRACUSE, N. Y.—W. D. Andrews Company; capital, \$50,000; to buy and sell athletic goods, including auto supplies. Incorporators: W. D. Andrews, R. Scroton.

TULSA, OKLA.—Central Garage Company; capital, \$50,000; to conduct a garage business. Incorporators: B. B. Calk, C. F. Tingley and others.

INCREASES OF CAPITAL

BUFFALO, N. Y.—Buffalo Gasoline Motor Company; \$100,000 to \$200,000.

CHICAGO, ILL.—Perfection Auto Top Company; \$15,000 to \$25,000.

COLUMBUS, O.—John W. Brown Manufacturing Company; \$125,000 to \$175,000.

DETROIT, MICH.—Warren Motor Car Company, \$300,000 to \$600,000.

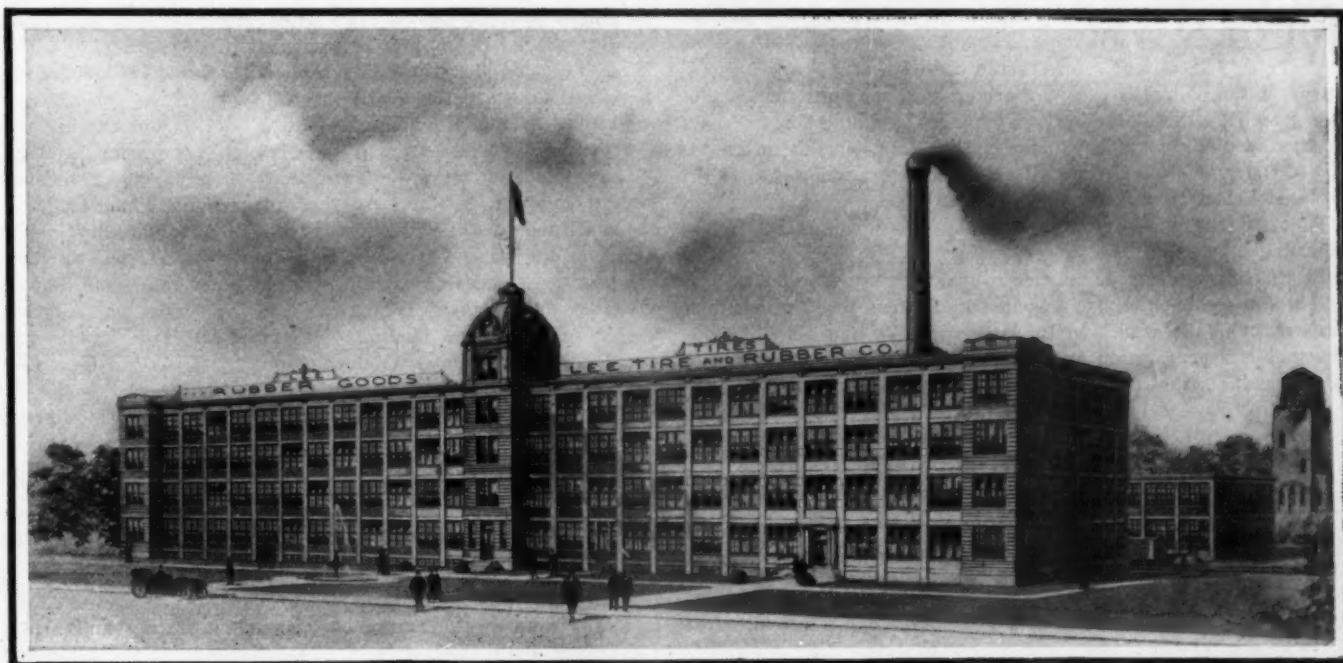
MILWAUKEE, WIS.—Milwaukee Tire & Supply Company; \$12,000 to \$20,000.

TWO RIVERS, WIS.—Standard Aluminum Company; \$50,000 to \$100,000.



Toledo factory where the Champion spark plug is made

Of Interest to the Industry



New reinforced concrete factory of the Lee Tire & Rubber Company at Spring Mill, Pa.

NEW Plant of Lee Tire & Rubber Company—The factory of the Lee Tire & Rubber Company is located on a tract of 32 acres at Spring Mill, Pa., just below Conshohocken. The main building is of reinforced concrete, four stories in height, with a frontage of 400 feet and a depth of 82 feet. A second building is of the same dimensions but only two stories high and has a capacity of 600 casings and 100 tubes per day. The two buildings have a floor space of more than 200,000 square feet.

Settles in Detroit—The American Rim Company is permanently located in Detroit, Mich., 601 Sun building. The New York office has been closed.

Krit to Make Additions—The Krit Motor Car Company, Detroit, Mich., has completed plans whereby several new buildings will be added to the company's present plant.

Dunlop Factory Expanding—The Dunlop Rubber Tire Company, Toronto, Ont., is erecting an addition to the factory in this city giving an additional 30,000 square feet of floor space.

Herreshoff to Move Soon—The Herreshoff Motor Company, Detroit, Mich., has nearly completed its new factory on Woodward avenue and expects to be installed in its new quarters within a week or 10 days.

Succeeds Owens & Son—Owens Wagon & Automobile Works is the latest manufacturing concern in Charlotte, N. C. It is to take the place of the firm of J. L. Owens & Son, successor to the Wadsworth Wagons Works.

Seeks Larger Quarters—The Motor Specialties Company, Waltham, Mass., which is carrying on the manufacture of automobile accessories in the factory building on Whitney avenue leased by the company has outgrown its present factory and is seeking a larger building.

Forging Company Resumes Work—The Alliance, O., Transue-Williams Company, Alliance, O., maker of drop forgings

for automobile work, whose plant was partially destroyed by fire February 12, has repaired the power plant, and resumed partial operations. Work on new building to replace burned structure will begin immediately.

Chase Company to Enlarge—Plans for enlarging the general offices of the Chase Motor Truck Company, Syracuse, N. Y., are being prepared. Another story will be added to the main building and much of this extra space will be taken by the office force.

Lauth-Juergens Expands—The Lauth Juergens Motor Car Company, Fremont, O., is preparing to enlarge its plant in that city besides putting the plant at Gibsonburg, O., in operation. As soon as the weather permits the company plans to begin the construction of a one-story brick and steel building, 250 by 60 feet. The structure will be used for assembling the trucks.

Factory for Omaha—Promoters of a new automobile manufacturing industry announce completion of plans for the erection of a factory and manufacture of cars in Omaha, Neb. The company is to be known as the Omaha Motor Car Company. The promoters say they propose to erect a brick factory building one story high and 400 by 125 feet, with two stories in front to provide for office room on the second floor. The factory, as planned, will cost \$1,000,000.

In Foundry Merger—The Canadian Billings & Spencer, Ltd., which has been manufacturing automobile parts and fine forgings of various kinds at Welland, Ont., for the past 5 years, is one of the three Canadian manufacturing firms merged into Canadian Foundries & Forgings, Ltd., with an authorized capitalization of \$1,250,000. This company is a branch or offshoot of the Billings & Spencer Company, of Hartford, Conn., and joins forces with the James Smart Manufacturing Company, of Brockville, Ont., and the Canada Forge, Ltd., of Welland, Ont. J. A. Mackay & Company, Montreal put the deal through.

Patents Gone to Issue

MIXER for Gaseous Fuel—Being a heated pipe placed into the carbureter mixing chamber.

This patent refers to the use of heating coils located in the mixing chamber of a carbureter, Fig. 1, against which the fuel raised by the motor suction impinges. Metallic screens may be used in direct contact with the coils for spraying the mixture.

No. 1,017,750—to George T. Hanchett, Hackensack, N. J. Granted February 20, 1912; filed July 16, 1908.

Electric Signal—Being a whistle alarm actuated by a vibrating diaphragm.

In this signal, Fig. 2, an electro-magnet serves to vibrate a diaphragm so that the air is excited in a chamber of which this diaphragm is the wall. In the other wall of the air-vibration chamber is a perforation and the motion of the air through the latter produces the sound, serving as an alarm.

No. 1,017,689—to Charles H. Rettmann, Chicago, Ill. Granted February 20, 1912; filed May 6, 1911.

Muffler—Being of the tubular, internal-expansion type.

The silencer, Fig. 3, comprises a housing in which two tubes are contained. The exhaust enters these tubes and then expands into expansion chambers, following the direction indicated by arrows. When the gases reach the innermost chamber they flow to the outlet of the muffler on the end opposite to the one fixed to the exhaust pipe.

No. 1,018,044—to John T. Gilmer, Florala, Ala. Granted February 20, 1912; filed June 26, 1911.

Anti-Skid Device—Consisting of a number of traction shoes fixed radially to the wheel hub.

The subject matter of this patent is the use of substantially J-shaped metal members, the longer ends of which are held to the hub of a wheel shod with a tire; the shorter end of each metal member fits around the tire and has an offset portion extending into the wheel felloe. The longer end of the traction members are connected so as to hold them in spaced relation.

No. 1,017,909—to James W. Reid, New York City. Granted February 20, 1912; filed March 16, 1911.

Shock Absorber—Containing a spiral spring and utilizing the friction idea.

This patent protects the combination of a shock-absorber consisting of a spiral spring which has an open central portion with two relatively movable parts. This portion is operatively connected to one of the movable members, and the outer

portion is fixed to the other, friction material being interposed between some of the outer convolutions of the spring.

No. 1,017,660—to Claud H. Foster, Cleveland, Ohio. Granted February 20, 1912; filed April 9, 1908.

Clutch—Being a sleeve carrying a friction clutch.

This patent refers to a positive clutch comprising a sleeve loosely mounted on an engine shaft and having a member rigidly connected to it. Another member is connected with the shaft and rotates with it, but is capable of longitudinal movement on the same. The sleeve also carries a friction clutch comprising a member rigidly secured to it and one loosely mounted upon it; a spring surrounds the sleeve and engages the loosely mounted friction clutch member, holding the two parts of the friction clutch engaged with a predetermined pressure. On the sleeve is a nut for adjusting the tension of the spring, which nut may be locked in place. Means are provided for holding the sleeve in place against endwise movement on the shaft. A driving wheel is secured to the loosely-mounted friction clutch member.

No. 1,018,008—to William H. Coldwell, Newburgh, N. Y. Granted February 20, 1912; filed June 21, 1910.

Acetylene Light Control—To regulate the intensity of the lights to either of two degrees.

This system, in addition to a gas tank, a burner and a pipe connecting both, comprises a valve located in the pipe and containing a plug having a port of large capacity and one of small capacity. By means of an electrical mechanism controlled from the dash the plug may be moved to bring either of the two ports into communication with the pipe, thereby adjusting the capacity of the latter to that of the respective port.

No. 1,018,154—to John L. Beck, Springfield, Mass. Granted February 20, 1912; filed February 18, 1911.

Attachment for Carbureters—Mechanism for automatically controlling the temperature of the mixture admitted to the engine cylinders.

An air-intake pipe is connected to a carbureter having an inlet port for cold air. Means are provided for heating air entering the pipe mentioned, and temperature—and pressure—controlled means which regulate the proportions of hot and cold air admitted to the pipe.

No. 1,017,572—to James R. Lund, Chicago, Ill. Granted February 13, 1912; filed December 18, 1911.

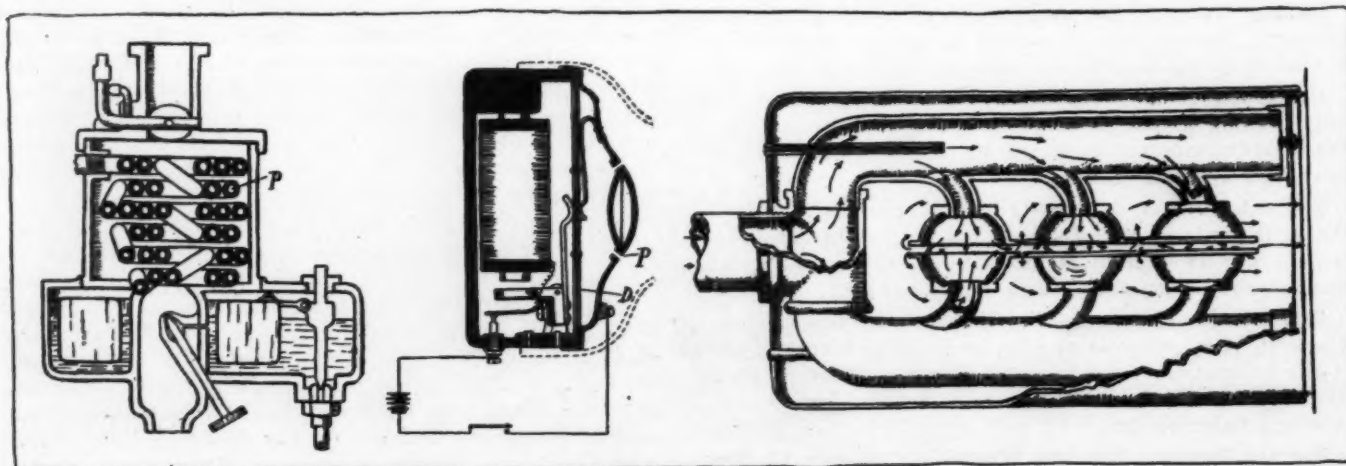


Fig. 1—Hanchett fuel mixer and heater. Fig. 2—Rettmann signal. Fig. 3—Gilmer muffler